sky130_osu_sc_15T_ms_tt_1P50_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_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.01491	0.01492	0.01148	1.48106	0.66731	1.41873
sky130_osu_sc_15T_ms__addf_l	0.01490	0.01492	0.01147	0.90191	0.66808	0.91007

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.16253	0.20979
sky130_osu_sc_15T_ms__addf_l	0.00000	0.10369	0.15094

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)	0.19211	2.03775	27.29530
	B->CO (RR)	0.17173	1.96348	26.44840
	CI->CO (RR)	0.18193	2.04875	27.63810
	CON->CO (FR)	0.03266	0.83699	11.73840
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.19923	1.88326	21.22190
	B->CO (RR)	0.19208	1.82672	20.70320
	CI->CO (RR)	0.18903	1.89489	21.58200
	CON->CO (FR)	0.04240	0.95597	11.92100

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)	0.27924	2.67287	35.44000
	B->CO (FF)	0.25158	2.56645	34.16700
	CI->CO (FF)	0.24778	2.62748	35.34820
	CON->CO (RF)	0.02814	0.69861	9.76492
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.26907	2.22888	24.65880
	B->CO (FF)	0.24206	2.14513	23.89520
	CI->CO (FF)	0.23776	2.18378	24.59950
	CON->CO (RF)	0.03013	0.68353	8.66893

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)	0.19787	1.15439	11.55180
	B->CON (FR)	0.17054	1.09288	11.21080
	CI->CON (FR)	0.16671	1.11068	11.51400
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.18760	1.14455	11.54970
	B->CON (FR)	0.16098	1.08370	11.20870
	CI->CON (FR)	0.15634	1.10087	11.51210

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)	0.11721	0.76545	7.99279
	B->CON (RF)	0.11259	0.75559	8.06727
	CI->CON (RF)	0.10678	0.77914	8.39199
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.11223	0.76074	7.99261
	B->CON (RF)	0.10791	0.75129	8.06710
	CI->CON (RF)	0.10178	0.77447	8.39182

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)	0.40052	2.48023	27.44970
	B->S (-R)	0.40792	2.46474	26.84330
	CI->S (-R)	0.36650	2.42898	27.34580
	CON->S (RR)	0.10464	0.80083	7.92282
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.38580	2.25193	21.89940
	B->S (-R)	0.39299	2.24545	21.59710
	CI->S (-R)	0.35171	2.20093	21.82360
	CON->S (RR)	0.10801	0.88230	7.88198

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)	0.32544	1.87524	19.70710
	B->S (-F)	0.32804	1.81549	19.15330
	CI->S (-F)	0.31425	1.88172	20.03380
	CON->S (FF)	0.13362	0.79867	7.00586
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.30372	1.64491	15.29040
	B->S (-F)	0.29663	1.57497	14.97630
	CI->S (-F)	0.29241	1.65323	15.64420
	CON->S (FF)	0.12545	0.78193	6.19890

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	0.00270	0.00259	0.00385
	B	0.00334	0.00333	0.00467
	CI	0.00333	0.00348	0.00513
sky130_osu_sc_15T_ms__addf_l	A	0.00214	0.00193	0.00261
	B	0.00278	0.00266	0.00335
	CI	0.00277	0.00281	0.00371

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00849	0.00862	0.01125
	B	0.00895	0.00915	0.01118
	CI	0.00790	0.00821	0.01036
sky130_osu_sc_15T_ms__addf_l	A	0.00857	0.00857	0.00954
	B	0.00841	0.00852	0.00957
	CI	0.00736	0.00761	0.00876

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00909	0.00910	0.00969
	B	0.00893	0.00907	0.00968
	CI	0.00789	0.00811	0.00889
sky130_osu_sc_15T_ms__addf_l	A	0.00857	0.00854	0.00914
	B	0.00840	0.00851	0.00912
	CI	0.00735	0.00755	0.00833

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00267	0.00252	0.00298
	B	0.00330	0.00323	0.00373
	CI	0.00332	0.00341	0.00408
sky130_osu_sc_15T_ms__addf_l	A	0.00211	0.00190	0.00236
	B	0.00275	0.00262	0.00311
	CI	0.00276	0.00279	0.00344

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00849	0.00862	0.01110
	B	0.00895	0.00914	0.01105
	CI	0.00790	0.00820	0.01019
sky130_osu_sc_15T_ms__addf_l	A	0.00857	0.00857	0.00958
	B	0.00842	0.00852	0.00958
	CI	0.00736	0.00761	0.00881

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01868	0.01882	0.01957
	B	0.01691	0.01667	0.01966
	CI	0.01529	0.01530	0.01625
sky130_osu_sc_15T_ms__addf_l	A	0.01791	0.01789	0.01863
	B	0.01618	0.01580	0.01895
	CI	0.01454	0.01444	0.01548

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00735	0.00810	1.45890	0.71971	1.49737
sky130_osu_sc_15T_ms__addh_l	0.00735	0.00810	0.92671	0.70810	0.94016

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.18281	0.20964
sky130_osu_sc_15T_ms__addh_l	0.00000	0.10922	0.15079

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)	0.13082	0.82887	7.91210
	B->CO (RR)	0.13528	0.82947	8.03755
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.13602	0.91404	7.88480
	B->CO (RR)	0.14056	0.91781	8.00732

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)	0.11030	0.76101	7.00710
	B->CO (FF)	0.11670	0.77549	7.05850
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.10442	0.70436	5.57800
	B->CO (FF)	0.11047	0.71905	5.63232

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	0.17635	0.69817	4.44111
	A->CON (FR)	!B	0.11113	1.03732	11.49140
	B->CON (RR)	A	0.18060	0.69773	4.55954
	B->CON (FR)	!A	0.13485	1.07784	11.60670
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.16253	0.67472	4.31611
	A->CON (FR)	!B	0.10141	1.01954	11.36860
	B->CON (RR)	A	0.16671	0.67707	4.43337
	B->CON (FR)	!A	0.12514	1.06134	11.48190

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	0.16982	0.83653	6.13031
	A->CON (RF)	!B	0.07003	0.74427	8.54396
	B->CON (FF)	A	0.16825	0.86437	6.40497
	B->CON (RF)	!A	0.08435	0.74331	8.33309
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.15791	0.81054	5.95823
	A->CON (RF)	!B	0.06529	0.73548	8.46995
	B->CON (FF)	A	0.15634	0.83903	6.23155
	B->CON (RF)	!A	0.07970	0.73506	8.26329

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	0.13573	1.97143	27.41660
	A->S (FR)	B	0.23608	2.04584	24.77580
	B->S (RR)	!A	0.15012	1.93258	26.54190
	B->S (FR)	A	0.23517	2.11303	25.70180
	CON->S (FR)	-	0.03509	0.85561	12.02790
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.13824	1.81815	21.63680
	A->S (FR)	B	0.23172	1.87777	18.95760
	B->S (RR)	!A	0.15290	1.78934	21.06180
	B->S (FR)	A	0.23052	1.93344	19.59530
	CON->S (FR)	-	0.04241	0.95793	12.09020

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	0.17790	2.42399	33.64150
	A->S (RF)	B	0.22823	1.63278	18.83410
	B->S (FF)	!A	0.20143	2.46717	33.81260
	B->S (RF)	A	0.23241	1.63278	18.96150
	CON->S (RF)	-	0.02664	0.68740	9.64935
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.16740	2.03894	24.13200
	A->S (RF)	B	0.21415	1.41389	13.34150
	B->S (FF)	!A	0.19102	2.08253	24.27140
	B->S (RF)	A	0.21840	1.41674	13.45430
	CON->S (RF)	-	0.02855	0.68599	8.75252

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	0.00406	0.00388	0.00425
	B	0.00000	0.00000	0.00000
	B	0.00371	0.00351	0.00368
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00352	0.00330	0.00412
	B	0.00000	0.00000	0.00000
	B	0.00317	0.00294	0.00349

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	0.00622	0.00600	0.00696
	B	0.00000	0.00000	0.00000
	B	0.00644	0.00648	0.00749
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00570	0.00546	0.00644
	B	0.00000	0.00000	0.00000
	B	0.00592	0.00591	0.00691

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	0.00405	0.00388	0.00453
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00545	0.00543	0.00570
	B	A	0.00000	0.00000	0.00000
	B	A	0.00370	0.00351	0.00394
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00605	0.00603	0.00606
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00351	0.00330	0.00401
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00509	0.00502	0.00529
	B	A	0.00000	0.00000	0.00000
	B	A	0.00316	0.00293	0.00352
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00569	0.00563	0.00566

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	0.00622	0.00602	0.00689
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00090	0.00089	0.00096
	B	A	0.00000	0.00000	0.00000
	B	A	0.00644	0.00647	0.00760
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00156	0.00147	0.00141
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00570	0.00547	0.00644
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00041	0.00038	0.00044
	B	A	0.00000	0.00000	0.00000
	B	A	0.00592	0.00591	0.00698
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00107	0.00097	0.00099

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	0.00623	0.00602	0.00706
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00091	0.00093	0.00107
	B	A	0.00000	0.00000	0.00000
	B	A	0.00645	0.00649	0.00762
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00158	0.00152	0.00163
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00571	0.00547	0.00642
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00041	0.00039	0.00047
	B	A	0.00000	0.00000	0.00000
	B	A	0.00592	0.00591	0.00702
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00109	0.00099	0.00102

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	0.00406	0.00387	0.00418
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00546	0.00554	0.00576
	B	A	0.00000	0.00000	0.00000
	B	A	0.00371	0.00350	0.00371
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00606	0.00608	0.00614
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00352	0.00330	0.00389
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00510	0.00508	0.00532
	B	A	0.00000	0.00000	0.00000
	B	A	0.00317	0.00293	0.00340
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00569	0.00566	0.00573

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00394	0.00403	1.47143
sky130_osu_sc_15T_ms__and2_2	0.00394	0.00404	2.88656
sky130_osu_sc_15T_ms__and2_4	0.00394	0.00404	5.59038
sky130_osu_sc_15T_ms__and2_6	0.00397	0.00403	8.16778
sky130_osu_sc_15T_ms__and2_8	0.00394	0.00404	10.61148
sky130_osu_sc_15T_ms__and2_l	0.00299	0.00310	0.89653

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.08733	0.13967
sky130_osu_sc_15T_ms__and2_2	0.00000	0.13968	0.13983
sky130_osu_sc_15T_ms__and2_4	0.00000	0.24440	0.27918
sky130_osu_sc_15T_ms__and2_6	0.00000	0.34911	0.41869
sky130_osu_sc_15T_ms__and2_8	0.00000	0.45382	0.55820
sky130_osu_sc_15T_ms__and2_l	0.00000	0.01374	0.02191

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)	0.09910	0.75423	7.60639
	B->Y (RR)	0.10539	0.76712	7.71896
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.11499	0.70228	7.80374
	B->Y (RR)	0.12128	0.70648	7.91253
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.15959	0.72653	8.28501
	B->Y (RR)	0.16591	0.71913	8.37612
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.20333	0.76843	8.55918
	B->Y (RR)	0.20936	0.75792	8.64019
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.24565	0.81704	8.84569
	B->Y (RR)	0.25195	0.80369	8.90009
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.11148	0.85755	7.49484
	B->Y (RR)	0.11789	0.86707	7.60449

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)	0.08439	0.68464	6.53840
	B->Y (FF)	0.08906	0.70107	6.61196
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.09797	0.65809	6.74373
	B->Y (FF)	0.10307	0.67129	6.81392
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.13795	0.68998	7.16011
	B->Y (FF)	0.14246	0.69870	7.22411
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.17988	0.73442	7.43913
	B->Y (FF)	0.18378	0.74156	7.48747
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.21905	0.77477	7.60797
	B->Y (FF)	0.22259	0.78138	7.65949
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.09688	0.72225	5.94193
	B->Y (FF)	0.10396	0.74272	6.03286

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	0.00308	0.00280	0.00604
	B	0.00000	0.00000	0.00000
	B	0.00314	0.00271	0.00452
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00594	0.00586	0.00892
	B	0.00000	0.00000	0.00000
	B	0.00598	0.00585	0.00757
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01226	0.01261	0.01504
	B	0.00000	0.00000	0.00000
	B	0.01228	0.01269	0.01392
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01859	0.01941	0.02153
	B	0.00000	0.00000	0.00000
	B	0.01872	0.01941	0.02102
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02508	0.02587	0.02928
	B	0.00000	0.00000	0.00000
	B	0.02499	0.02575	0.02834
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00222	0.00197	0.00425
	B	0.00000	0.00000	0.00000
	B	0.00229	0.00194	0.00329

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	0.00760	0.00765	0.01145
	B	0.00000	0.00000	0.00000
	B	0.00857	0.00852	0.01202
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00954	0.00999	0.01367
	B	0.00000	0.00000	0.00000
	B	0.01052	0.01085	0.01422
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01434	0.01561	0.01927
	B	0.00000	0.00000	0.00000
	B	0.01534	0.01640	0.01972
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01919	0.02126	0.02514
	B	0.00000	0.00000	0.00000
	B	0.02024	0.02195	0.02545
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02409	0.02668	0.03087
	B	0.00000	0.00000	0.00000
	B	0.02499	0.02725	0.03101
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00579	0.00576	0.00825
	B	0.00000	0.00000	0.00000
	B	0.00648	0.00638	0.00867

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)	-0.00272	-0.00274	-0.00275
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00272	-0.00274	-0.00275
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00272	-0.00274	-0.00275
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00274	-0.00275	-0.00276
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00272	-0.00273	-0.00274
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00193	-0.00193	-0.00194

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00275	0.00275	0.00276
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00275	0.00276	0.00276
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00275	0.00275	0.00276
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00283	0.00278
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00276	0.00281	0.00276
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00195	0.00196	0.00195

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)	-0.00258	-0.00260	-0.00258
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00258	-0.00259	-0.00258
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00258	-0.00259	-0.00258
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00258	-0.00259	-0.00258
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00258	-0.00260	-0.00258
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00183	-0.00184	-0.00184

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)	0.00260	0.00263	0.00259
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00259	0.00259
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00263	0.00259
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00263	0.00260
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00261	0.00264	0.00260
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00185	0.00185	0.00184

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00370	0.00388	0.00375	0.64719

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.03427	0.06976

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)	0.10618	1.06927	11.44390
	A1->Y (FR)	0.08956	1.01643	11.08520
	B0->Y (FR)	0.07872	1.02858	11.41290

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)	0.06280	0.68402	7.59650
	A1->Y (RF)	0.05709	0.69333	7.90029
	B0->Y (RF)	0.03554	0.62719	7.42797

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	0.00650	0.00643	0.00648
	A1	0.00000	0.00000	0.00000
	A1	0.00547	0.00537	0.00536
	B0	0.00520	0.00510	0.00554

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	0.00144	0.00122	0.00124
	A1	0.00000	0.00000	0.00000
	A1	0.00147	0.00123	0.00131
	B0	-0.00059	-0.00066	-0.00053

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)	-0.00208	-0.00234	-0.00235
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00238	-0.00238	-0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00238	-0.00239	-0.00239

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)	0.00234	0.00235	0.00235
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00239	0.00244	0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00240	0.00244	0.00239

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)	-0.00206	-0.00230	-0.00231
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00234	-0.00235	-0.00234
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00254	-0.00257	-0.00257

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)	0.00230	0.00232	0.00231
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00234	0.00236	0.00235
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00257	0.00258	0.00258

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)	-0.00121	-0.00122	-0.00122

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)	0.00135	0.00135	0.00125

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00369	0.00385	0.00399	0.00379	0.66880

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.03816	0.13951

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)	0.13048	1.09748	11.56040
	A1->Y (FR)	0.11655	1.07314	11.46140
	B0->Y (FR)	0.08043	1.01618	11.39700
	B1->Y (FR)	0.09445	1.04616	11.53780

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)	0.08174	0.71170	7.74728
	A1->Y (RF)	0.07595	0.72097	8.04862
	B0->Y (RF)	0.04341	0.68147	8.01290
	B1->Y (RF)	0.04911	0.67398	7.71154

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	0.00800	0.00794	0.00794
	A1	0.00700	0.00688	0.00690
	B0	0.00559	0.00527	0.00587
	B1	0.00655	0.00639	0.00689

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00292	0.00269	0.00267
	A1	0.00294	0.00270	0.00276
	B0	-0.00037	-0.00045	-0.00034
	B1	-0.00033	-0.00043	-0.00038

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)	-0.00212	-0.00234	-0.00234
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00238	-0.00240	-0.00239
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00238	-0.00239	-0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00238	-0.00239	-0.00239

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)	0.00234	0.00237	0.00234
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00238	0.00241	0.00239
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00240	0.00244	0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00240	0.00244	0.00239

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)	-0.00209	-0.00230	-0.00230
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00234	-0.00235	-0.00234
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00253	-0.00256	-0.00257
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00253	-0.00256	-0.00257

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)	0.00230	0.00233	0.00230
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00234	0.00238	0.00235
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00257	0.00259	0.00257
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00257	0.00259	0.00257

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)	-0.00122	-0.00123	-0.00122
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00121	-0.00123	-0.00122
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00264	-0.00264	-0.00266
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00264	-0.00264	-0.00266

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)	0.00141	0.00141	0.00127
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00122	0.00123	0.00122
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00266	0.00268	0.00267
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00266	0.00268	0.00267

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)	-0.00123	-0.00123	-0.00123
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00122	-0.00123	-0.00123
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00243	-0.00244	-0.00244
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00243	-0.00244	-0.00244

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)	0.00142	0.00142	0.00128
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00123	0.00124	0.00123
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00245	0.00244	0.00244
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00245	0.00244	0.00244

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00403	1.45063
sky130_osu_sc_15T_ms__buf_2	0.00407	2.87977
sky130_osu_sc_15T_ms__buf_4	0.00407	5.56352
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00407	10.74331
sky130_osu_sc_15T_ms__buf_l	0.00313	0.89276

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.06992	0.06992
sky130_osu_sc_15T_ms__buf_2	0.00000	0.10488	0.13967
sky130_osu_sc_15T_ms__buf_4	0.00000	0.17479	0.27918
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.31462	0.55819
sky130_osu_sc_15T_ms__buf_l	0.00000	0.01108	0.01108

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)**	0.07236	0.71745	7.51729
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.08289	0.65463	7.72208
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.11278	0.65651	8.09749
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.17031	0.71696	8.64179
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.08324	0.81225	7.34014

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)**	0.08025	0.67234	6.42037
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.09548	0.66452	6.95078
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.13583	0.69759	7.43790
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.21732	0.78361	8.00953
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.09349	0.71003	5.87562

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	0.00292	0.00264	0.00504
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00576	0.00552	0.00810
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01207	0.01233	0.01457
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02469	0.02573	0.02796
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00218	0.00187	0.00386

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	0.00738	0.00735	0.01104
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00936	0.00965	0.01312
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01420	0.01524	0.01877
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02396	0.02619	0.03005
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00567	0.00556	0.00801

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
	-0.00050	-0.00050	-0.00049

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
	0.00050	0.00050	0.00049

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00380	0.00380	0.01131	1.36137	1.35171
sky130_osu_sc_15T_ms__dffr_l	0.00380	0.00380	0.01131	0.90054	0.89722

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.20122	0.34632
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.14238	0.28747

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)	0.43342	1.72889	16.58540
	QN->Q (FR)	0.04046	0.95704	13.20440
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.42020	1.82133	15.67310
	QN->Q (FR)	0.04649	1.03550	12.89000

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)	0.39291	1.77349	18.03690
	QN->Q (RF)	0.03150	0.75258	10.33680
	RN->Q (FF)	0.28137	1.74143	18.74290
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.40225	1.92611	17.31670
	QN->Q (RF)	0.03218	0.73872	9.33359
	RN->Q (FF)	0.29141	1.89425	18.01270

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)	0.34422	1.02667	7.84376
	RN->QN (FR)	0.23244	0.99479	8.54922
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.34827	1.11942	7.96113
	RN->QN (FR)	0.23692	1.08737	8.65605

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)**	0.37172	0.94104	5.89932
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.34968	0.92207	5.28370

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)	-0.08920	-0.11592	-0.50461
	setup	CK (R)	0.34308	0.35987	1.37889
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08730	-0.11529	-0.50614
	setup	CK (R)	0.34215	0.36162	1.39095

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)	-0.15116	-0.44282	-3.53610
	setup	CK (R)	0.18323	0.46020	3.56615
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.14930	-0.44636	-3.53555
	setup	CK (R)	0.18323	0.46020	3.56611

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)	-0.08920	-0.11592	-0.50461
	setup	CK (R)	0.34308	0.35987	1.37889
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08730	-0.11529	-0.50614
	setup	CK (R)	0.34215	0.36162	1.39095

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)	-0.15116	-0.44282	-3.53610
	setup	CK (R)	0.18323	0.46020	3.56615
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.14930	-0.44636	-3.53555
	setup	CK (R)	0.18323	0.46020	3.56611

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)	0.29261	0.31130	1.31986
	removal	CK (R)	-0.06114	-0.07241	-0.17226
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.29331	0.31285	1.33321
	removal	CK (R)	-0.06114	-0.07241	-0.17332

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)	0.29261	0.31130	1.31986
	removal	CK (R)	-0.06114	-0.07241	-0.17226
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.29331	0.31285	1.33321
	removal	CK (R)	-0.06114	-0.07241	-0.17332

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 ()	0.16719	0.50415	13.33370
	min_pulse_width	RN ()	0.16719	0.50415	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.16340	0.50415	13.33370
	min_pulse_width	RN ()	0.16340	0.50415	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 ()	0.20126	0.50415	13.33370
	min_pulse_width	CK ()	0.21262	0.50415	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.18612	0.50415	13.33370
	min_pulse_width	CK ()	0.20884	0.50415	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 ()	0.42464	0.50415	13.33370
	min_pulse_width	CK ()	0.15204	0.50415	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.42464	0.50415	13.33370
	min_pulse_width	CK ()	0.15204	0.50415	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	0.00755	0.00604	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00667	0.00547	0.00013

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	0.00841	0.00701	0.00000
	RN	-0.00100	-0.05378	-0.76577
	RN	0.01924	0.01793	0.00522
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00751	0.00659	0.00162
	RN	-0.00100	-0.04197	-0.50655
	RN	0.01833	0.01749	0.01256

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	0.00841	0.00702	0.00000
	RN	-0.00100	-0.05355	-0.76033
	RN	0.01923	0.01794	0.00501
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00751	0.00659	0.00154
	RN	-0.00100	-0.04188	-0.50468
	RN	0.01833	0.01750	0.01254

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	0.00751	0.00601	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00663	0.00544	0.00035

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	-0.00197	-0.00230	-0.00234
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00900	0.00849	0.00948
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00383	0.00338	0.00451
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00197	-0.00230	-0.00234
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00900	0.00849	0.00948
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00383	0.00337	0.00451

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	0.00231	0.00235	0.00234
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01444	0.01418	0.01537
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00692	0.00671	0.00792
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00231	0.00235	0.00234
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01444	0.01419	0.01537
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00692	0.00671	0.00792

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)	0.00277	0.00226	0.00507
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00818	0.00746	0.01017
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)	0.00277	0.00226	0.00507
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00818	0.00746	0.01017

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)	0.00704	0.00681	0.01061
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01451	0.01403	0.01753
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)	0.00704	0.00680	0.01061
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01451	0.01402	0.01753

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)	-0.00047	-0.00103	0.00156
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00436	0.00333	0.00589
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00075	-0.00136	0.00132
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00047	-0.00103	0.00156
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00436	0.00333	0.00590
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00076	-0.00136	0.00132

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)	0.01098	0.01074	0.01445
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02290	0.02206	0.02526
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01730	0.01684	0.02011
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02255	0.02195	0.02922
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01210	0.01181	0.01541
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01098	0.01074	0.01444
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02290	0.02206	0.02526
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01730	0.01684	0.02011
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02255	0.02195	0.02922
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01210	0.01181	0.01541

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00376	0.00380	0.00841	0.01159	1.47793	1.48635
sky130_osu_sc_15T_ms__dffsr_l	0.00376	0.00380	0.00839	0.01159	0.89993	0.89285

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.24998	0.34618
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.19114	0.28734

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)	0.41464	1.73112	17.39060
	QN->Q (FR)	0.03559	0.89585	12.56670
	RN->Q (RR)	0.33446	1.66690	17.44490
	SN->Q (FR)	0.30458	1.72133	18.65410
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.41467	1.82124	15.70210
	QN->Q (FR)	0.04653	1.03381	12.86530
	RN->Q (RR)	0.33486	1.75716	15.75740
	SN->Q (FR)	0.30489	1.81025	16.93070

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)	0.45682	1.84038	18.60670
	QN->Q (RF)	0.03115	0.77376	10.83830
	RN->Q (FF)	0.29364	1.75984	19.33430
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.47297	2.00253	17.38670
	QN->Q (RF)	0.03212	0.73785	9.32275
	RN->Q (FF)	0.31022	1.92021	18.10000

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)	0.40795	1.08645	7.99646
	RN->QN (FR)	0.24591	1.00579	8.71895
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.41750	1.19412	8.01510
	RN->QN (FR)	0.25569	1.11386	8.72761

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)	0.35905	0.95127	6.43422
	RN->QN (RF)	0.27916	0.88762	6.48847
	SN->QN (FF)	0.24941	0.94236	7.69390
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.34753	0.92304	5.32014
	RN->QN (RF)	0.26807	0.86044	5.36834
	SN->QN (FF)	0.23815	0.91297	6.53898

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)	-0.09163	-0.12287	-0.57919
	setup	CK (R)	0.31707	0.33078	1.42186
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09107	-0.12274	-0.57821
	setup	CK (R)	0.31513	0.33020	1.42486

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)	-0.17863	-0.47183	-3.74071
	setup	CK (R)	0.22628	0.48468	3.77138
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.17792	-0.47262	-3.73870
	setup	CK (R)	0.22580	0.48468	3.77052

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)	-0.09163	-0.12287	-0.57919
	setup	CK (R)	0.31707	0.33078	1.42186
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09107	-0.12274	-0.57821
	setup	CK (R)	0.31513	0.33020	1.42486

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)	-0.17863	-0.47183	-3.74071
	setup	CK (R)	0.22628	0.48468	3.77138
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.17792	-0.47262	-3.73870
	setup	CK (R)	0.22580	0.48468	3.77052

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)	0.24214	0.26123	1.25020
	removal	CK (R)	-0.02958	-0.03610	-0.11485
	hold	SN (R)	-0.24422	-0.47964	-2.71634
	setup	SN (R)	0.27066	0.52825	4.95566
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.24264	0.25683	1.24717
	removal	CK (R)	-0.02958	-0.03610	-0.11485
	hold	SN (R)	-0.23673	-0.46763	-2.62772
	setup	SN (R)	0.27314	0.51621	4.82828

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)	0.24214	0.26123	1.25020
	removal	CK (R)	-0.02958	-0.03610	-0.11485
	hold	SN (R)	-0.24422	-0.47964	-2.71634
	hold	SN (R)	-0.24422	-0.47964	-2.72521
	setup	SN (R)	0.27066	0.52825	4.77189
	setup	SN (R)	0.26933	0.52778	4.95566
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.24264	0.25683	1.24717
	removal	CK (R)	-0.02958	-0.03610	-0.11485
	hold	SN (R)	-0.23797	-0.46763	-2.62772
	hold	SN (R)	-0.23673	-0.46792	-2.63803
	setup	SN (R)	0.27314	0.51486	4.65301
	setup	SN (R)	0.25798	0.51621	4.82828

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 ()	0.18990	0.50415	13.33370
	min_pulse_width	RN ()	0.19369	0.50415	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.18990	0.50415	13.33370
	min_pulse_width	RN ()	0.18612	0.50415	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)	0.05636	0.09339	2.95278
	removal	CK (R)	-0.02145	-0.06768	-0.49377
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05644	0.09327	2.82699
	removal	CK (R)	-0.02145	-0.06768	-0.50176

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)	0.05636	0.09339	2.95278
	removal	CK (R)	-0.02145	-0.06768	-0.49377
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05644	0.09327	2.82699
	removal	CK (R)	-0.02145	-0.06768	-0.50176

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 ()	0.24023	0.51513	13.33370
	min_pulse_width	SN ()	0.24120	0.51732	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.23912	0.50415	13.33370
	min_pulse_width	SN ()	0.22777	0.50415	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 ()	0.18990	0.50415	13.33370
	min_pulse_width	CK ()	0.23912	0.50415	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.17855	0.50415	13.33370
	min_pulse_width	CK ()	0.23534	0.50415	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 ()	0.39814	0.50415	13.33370
	min_pulse_width	CK ()	0.20126	0.50415	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.39814	0.50415	13.33370
	min_pulse_width	CK ()	0.20126	0.50415	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	0.00934	0.00776	-0.00108
	RN	0.01704	0.01572	0.00016
	SN	-0.00100	-0.05650	-0.83133
	SN	0.01873	0.01737	0.00100
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00855	0.00739	0.00222
	RN	0.01624	0.01536	0.00858
	SN	-0.00100	-0.04196	-0.50621
	SN	0.01793	0.01699	0.00980

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	0.00978	0.00891	0.00108
	RN	-0.00100	-0.05650	-0.83133
	RN	0.02004	0.01910	0.01159
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00895	0.00811	0.00298
	RN	-0.00100	-0.04196	-0.50621
	RN	0.01918	0.01827	0.01355

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	0.00977	0.00891	0.00098
	RN	-0.00100	-0.05669	-0.83605
	RN	0.02003	0.01909	0.01151
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00895	0.00812	0.00317
	RN	-0.00100	-0.04176	-0.50223
	RN	0.01918	0.01827	0.01361

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	0.00931	0.00772	-0.00098
	RN	0.01701	0.01570	-0.00006
	SN	-0.00100	-0.05669	-0.83603
	SN	0.01869	0.01731	0.00126
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00850	0.00735	0.00229
	RN	0.01620	0.01531	0.00885
	SN	-0.00100	-0.04176	-0.50220
	SN	0.01788	0.01694	0.01002

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	-0.00228	-0.00232	-0.00232
	(!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)	0.01153	0.01106	0.01205
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00434	0.00391	0.00499
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00434	0.00390	0.00500
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00438	0.00394	0.00502
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00228	-0.00233	-0.00232
	(!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)	0.01153	0.01106	0.01205
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00434	0.00391	0.00499
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00434	0.00390	0.00500
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00438	0.00394	0.00502

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	0.00233	0.00234	0.00232
	(!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)	0.01667	0.01641	0.01735
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00739	0.00722	0.00842
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00745	0.00725	0.00843
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00735	0.00718	0.00838
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00233	0.00234	0.00232
	(!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)	0.01667	0.01641	0.01734
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00738	0.00721	0.00841
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00744	0.00724	0.00842
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00734	0.00717	0.00837

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)	0.00262	0.00216	0.00473
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01004	0.00936	0.01189
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)	0.00262	0.00216	0.00473
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01004	0.00936	0.01189

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)	0.00762	0.00744	0.01127
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01539	0.01485	0.01844
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)	0.00761	0.00742	0.01126
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01538	0.01484	0.01843

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)	-0.00537	-0.00543	-0.00544
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00532	-0.00574	-0.00576
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00524	-0.00545	-0.00546
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00354	0.00304	0.00443
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)	-0.00537	-0.00544	-0.00544
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00530	-0.00573	-0.00574
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00523	-0.00544	-0.00546
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00355	0.00304	0.00444

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)	0.00543	0.00549	0.00546
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00575	0.00580	0.00577
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00546	0.00545	0.00548
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01188	0.01157	0.01251
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)	0.00543	0.00549	0.00546
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00573	0.00578	0.00575
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00546	0.00544	0.00547
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01187	0.01156	0.01250

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)	-0.00047	-0.00103	0.00156
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00502	0.00405	0.00660
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00493	0.00396	0.00655
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00061	-0.00124	0.00147
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00323	0.00205	0.00765
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00047	-0.00103	0.00155
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00502	0.00404	0.00659
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00493	0.00395	0.00654
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00061	-0.00124	0.00147
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00323	0.00205	0.00765

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)	0.02559	0.02481	0.02801
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01102	0.01077	0.01448
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01765	0.01722	0.02050
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01769	0.01726	0.02051
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02474	0.02404	0.03109
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01199	0.01170	0.01530
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01461	0.01414	0.02154
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02559	0.02481	0.02801
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01102	0.01077	0.01448
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01765	0.01722	0.02050
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01769	0.01726	0.02051
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02474	0.02403	0.03108
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01199	0.01170	0.01530
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01460	0.01413	0.02154

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00379	0.00670	0.01137	1.35884	1.35824
sky130_osu_sc_15T_ms__dffs_l	0.00379	0.00670	0.01137	0.89840	0.89442

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.17913	0.27608
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.12029	0.21724

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)	0.31956	1.59368	16.38960
	QN->Q (FR)	0.04048	0.95545	13.12870
	SN->Q (FR)	0.24883	1.66278	17.73370
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.31676	1.69988	15.50040
	QN->Q (FR)	0.04647	1.03090	12.83120
	SN->Q (FR)	0.24530	1.76350	16.78060

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)	0.44024	1.82226	18.00530
	QN->Q (RF)	0.03133	0.74955	10.29350
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.44689	1.97021	17.29040
	QN->Q (RF)	0.03205	0.73585	9.29994

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)	0.38910	1.07944	7.90282
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.39099	1.16575	7.96824

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)**	0.26456	0.81277	5.78880
	SN->QN (FF)	0.19309	0.88333	7.12606
sky130_osu_sc_15T_ms__dffs_l	**CK->QN (RF)**	0.25310	0.80581	5.15123
	SN->QN (FF)	0.18101	0.86996	6.43541

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)	-0.06915	-0.10184	-0.47127
	setup	CK (R)	0.23282	0.26237	1.34668
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07041	-0.09911	-0.47055
	setup	CK (R)	0.23317	0.26215	1.35729

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)	-0.15730	-0.44732	-3.57260
	setup	CK (R)	0.20884	0.46489	3.60651
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.15651	-0.44848	-3.56883
	setup	CK (R)	0.20853	0.46489	3.60707

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)	-0.06915	-0.10184	-0.47127
	setup	CK (R)	0.23282	0.26237	1.34668
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07041	-0.09911	-0.47055
	setup	CK (R)	0.23317	0.26215	1.35729

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)	-0.15730	-0.44732	-3.57260
	setup	CK (R)	0.20884	0.46489	3.60651
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.15651	-0.44848	-3.56883
	setup	CK (R)	0.20853	0.46489	3.60707

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)	0.05855	0.08861	2.07348
	removal	CK (R)	-0.02193	-0.05507	-0.27151
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.05512	0.08648	1.93660
	removal	CK (R)	-0.02107	-0.05507	-0.27151

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)	0.05855	0.08861	2.07348
	removal	CK (R)	-0.02193	-0.05507	-0.27151
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.05512	0.08648	1.93660
	removal	CK (R)	-0.02107	-0.05507	-0.27151

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 ()	0.17388	0.52610	13.33370
	min_pulse_width	SN ()	0.17783	0.52610	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.17097	0.50415	13.33370
	min_pulse_width	SN ()	0.16786	0.50635	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 ()	0.13690	0.50415	13.33370
	min_pulse_width	CK ()	0.22398	0.50415	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.12933	0.50415	13.33370
	min_pulse_width	CK ()	0.22019	0.50415	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 ()	0.31485	0.50415	13.33370
	min_pulse_width	CK ()	0.18233	0.50415	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.31485	0.50415	13.33370
	min_pulse_width	CK ()	0.18233	0.50415	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	0.00756	0.00602	0.00000
	SN	-0.00100	-0.05372	-0.76435
	SN	0.01597	0.01457	0.00168
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00667	0.00544	0.00037
	SN	-0.00100	-0.04191	-0.50535
	SN	0.01507	0.01400	0.00817

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	0.00836	0.00703	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00746	0.00658	0.00178

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	0.00835	0.00704	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00746	0.00660	0.00163

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	0.00753	0.00598	0.00000
	SN	-0.00100	-0.05371	-0.76397
	SN	0.01593	0.01454	0.00175
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00663	0.00541	0.00041
	SN	-0.00100	-0.04180	-0.50309
	SN	0.01503	0.01396	0.00815

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	-0.00232	-0.00236	-0.00236
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00873	0.00819	0.00916
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00374	0.00329	0.00440
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00232	-0.00236	-0.00236
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00873	0.00819	0.00916
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00374	0.00329	0.00440

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	0.00236	0.00239	0.00236
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01420	0.01391	0.01502
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00704	0.00685	0.00810
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00236	0.00239	0.00236
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01420	0.01391	0.01502
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00704	0.00685	0.00810

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)	-0.00391	-0.00393	-0.00393
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00297	0.00259	0.00422
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)	-0.00391	-0.00393	-0.00393
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00297	0.00258	0.00422

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)	0.00395	0.00398	0.00394
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00834	0.00796	0.01006
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)	0.00395	0.00398	0.00394
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00834	0.00796	0.01006

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)	-0.00049	-0.00105	0.00154
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00072	-0.00135	0.00136
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00260	0.00142	0.00719
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00049	-0.00106	0.00154
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00072	-0.00135	0.00136
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00260	0.00142	0.00718

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)	0.02274	0.02190	0.02520
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01099	0.01075	0.01446
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02223	0.02151	0.02870
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01205	0.01176	0.01536
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01420	0.01376	0.02122
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02274	0.02190	0.02519
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01099	0.01075	0.01446
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02223	0.02150	0.02870
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01205	0.01176	0.01536
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01420	0.01376	0.02122

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00395	0.01124	1.48985	1.48988
sky130_osu_sc_15T_ms__dff_l	0.00395	0.01123	0.82303	0.82611

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.22597	0.27973
sky130_osu_sc_15T_ms__dff_l	0.00000	0.16713	0.22088

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)	0.26234	1.55836	17.26520
	QN->Q (FR)	0.03536	0.89467	12.58900
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.27243	1.63214	14.69690
	QN->Q (FR)	0.05185	1.09261	13.25890

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)	0.37594	1.75640	18.61400
	QN->Q (RF)	0.03101	0.77387	10.86260
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.39893	1.91375	16.63980
	QN->Q (RF)	0.03215	0.71647	8.91338

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)	0.32936	0.99809	7.89329
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.34371	1.12777	7.88817

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)	0.21340	0.77693	6.21322
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.20930	0.74280	4.77827

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)	-0.06211	-0.09385	-0.47947
	setup	CK (R)	0.17640	0.20932	1.35714
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.06386	-0.09443	-0.48037
	setup	CK (R)	0.17549	0.20757	1.35859

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)	-0.14709	-0.45297	-3.63348
	setup	CK (R)	0.18195	0.47078	3.66379
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.14865	-0.45297	-3.62825
	setup	CK (R)	0.18171	0.47078	3.67182

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 ()	0.11418	0.50415	13.33370
	min_pulse_width	CK ()	0.21262	0.50415	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.11040	0.50415	13.33370
	min_pulse_width	CK ()	0.20505	0.50415	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 ()**	0.25805	0.50415	13.33370
	min_pulse_width	**CK ()**	0.14826	0.50415	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.25805	0.50415	13.33370
	min_pulse_width	**CK ()**	0.14447	0.50415	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	0.00800	0.00629	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00721	0.00597	0.00120

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	0.00851	0.00763	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00768	0.00653	-0.00110

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	0.00851	0.00762	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00768	0.00654	-0.00118

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	0.00797	0.00625	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00717	0.00594	0.00154

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	-0.00197	-0.00230	-0.00233
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00824	0.00773	0.00875
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00197	-0.00230	-0.00233
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00824	0.00774	0.00876

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	0.00231	0.00234	0.00233
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01472	0.01438	0.01552
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00231	0.00234	0.00233
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01473	0.01439	0.01553

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)	-0.00049	-0.00105	0.00155
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00071	-0.00133	0.00139
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00049	-0.00105	0.00155
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00071	-0.00133	0.00138

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)	0.01093	0.01068	0.01440
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02224	0.02147	0.02479
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02259	0.02182	0.02912
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01198	0.01169	0.01532
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01093	0.01068	0.01440
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02225	0.02147	0.02480
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02259	0.02181	0.02912
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01198	0.01169	0.01531

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00385	1.42327
sky130_osu_sc_15T_ms__inv_10	0.03541	13.11035
sky130_osu_sc_15T_ms__inv_2	0.00727	2.82686
sky130_osu_sc_15T_ms__inv_3	0.01082	4.04497
sky130_osu_sc_15T_ms__inv_4	0.01428	5.44340
sky130_osu_sc_15T_ms__inv_6	0.02139	8.03123
sky130_osu_sc_15T_ms__inv_8	0.02840	10.72086
sky130_osu_sc_15T_ms__inv_l	0.00289	0.81477

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.03496	0.06976
sky130_osu_sc_15T_ms__inv_10	0.00000	0.34958	0.69754
sky130_osu_sc_15T_ms__inv_2	0.00000	0.06992	0.13951
sky130_osu_sc_15T_ms__inv_3	0.00000	0.10488	0.20926
sky130_osu_sc_15T_ms__inv_4	0.00000	0.13983	0.27902
sky130_osu_sc_15T_ms__inv_6	0.00000	0.20975	0.41852
sky130_osu_sc_15T_ms__inv_8	0.00000	0.27966	0.55803
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00554	0.01084

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)**	0.03405	0.83856	11.65830
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.04543	0.57786	11.61580
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02700	0.72293	11.60570
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02943	0.67452	11.56310
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02973	0.64349	11.54850
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.03339	0.60736	11.54180
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03896	0.59061	11.62450
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.04550	0.96057	11.70780

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)**	0.02782	0.68911	9.57647
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03896	0.47649	9.56353
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02264	0.60294	9.57823
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02458	0.57112	9.61788
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02432	0.54279	9.60370
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02908	0.51017	9.60719
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03390	0.49029	9.65765
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02958	0.66345	8.25063

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	0.00383	0.00384	0.00418
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03232	0.03392	0.03779
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00675	0.00689	0.00762
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01036	0.00985	0.01177
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01327	0.01376	0.01522
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01966	0.01899	0.02277
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02602	0.02696	0.03030
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00286	0.00283	0.00310

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	-0.00071	-0.00074	-0.00062
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01286	-0.01220	-0.00929
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00235	-0.00229	-0.00196
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00312	-0.00300	-0.00246
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00486	-0.00466	-0.00380
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00741	-0.00714	-0.00564
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01012	-0.00949	-0.00750
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00044	-0.00048	-0.00038

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.18568	0.18557	0.00787	0.18192

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.07002	0.07002

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)	-	0.01994	0.36877	3.72650
	A1->Y (RR)	-	0.02222	0.37084	3.73057
	S0->Y (RR)	(!A0 * A1)	0.06306	0.36690	1.51261
	S0->Y (FR)	(A0 * !A1)	0.04219	0.46247	3.48297

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)	-	0.02021	0.33943	3.30621
	A1->Y (FF)	-	0.01844	0.33679	3.30020
	S0->Y (FF)	(!A0 * A1)	0.07913	0.42849	2.15023
	S0->Y (RF)	(A0 * !A1)	0.03127	0.38237	2.79574

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	-	-0.00390	-0.00391	-0.00391
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00267	-0.00267	-0.00267
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00480	0.00465	0.00886
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00256	-0.00307	0.00014

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	-	0.00390	0.00391	0.00391
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00267	0.00267	0.00267
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00079	0.00030	0.00368
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01027	0.01003	0.01404

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)	-0.00098	-0.00098	-0.00098

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)	0.00098	0.00098	0.00098

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)	-0.00116	-0.00116	-0.00117

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)	0.00116	0.00116	0.00117

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)	-0.00091	-0.00141	0.00193
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00087	-0.00139	0.00194

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)	0.00783	0.00765	0.01164
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00724	0.00708	0.01127

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00385	0.00382	1.24121
sky130_osu_sc_15T_ms__nand2_l	0.00288	0.00288	0.80717

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.03497	0.13951
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00555	0.02168

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)	0.03527	0.80678	10.84900
	B->Y (FR)	0.04126	0.80312	10.71490
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.04677	0.96127	11.68020
	B->Y (FR)	0.05543	0.96728	11.65910

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)	0.04210	0.85327	11.43710
	B->Y (RF)	0.04801	0.84746	11.20530
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.04500	0.86446	10.39880
	B->Y (RF)	0.05026	0.85403	10.11100

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	0.00406	0.00405	0.00372
	B	0.00000	0.00000	0.00000
	B	0.00509	0.00502	0.00536
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00300	0.00278	0.00322
	B	0.00000	0.00000	0.00000
	B	0.00374	0.00348	0.00390

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	-0.00046	-0.00053	-0.00041
	B	0.00000	0.00000	0.00000
	B	-0.00042	-0.00050	-0.00044
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00035	-0.00026
	B	0.00000	0.00000	0.00000
	B	-0.00028	-0.00034	-0.00029

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)	-0.00266	-0.00267	-0.00269
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00185	-0.00185	-0.00186

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)	0.00269	0.00275	0.00270
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00186	0.00186	0.00187

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)	-0.00246	-0.00247	-0.00247
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00171	-0.00172	-0.00172

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)	0.00249	0.00247	0.00248
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00173	0.00172	0.00172

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00382	0.00411	0.70962
sky130_osu_sc_15T_ms__nor2_l	0.00279	0.00311	0.44170

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.02600	0.06976
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00438	0.01084

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)	0.07759	1.02180	11.52200
	B->Y (FR)	0.06139	0.98796	11.40720
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.09525	1.16366	11.52660
	B->Y (FR)	0.08092	1.14182	11.55160

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)	0.03690	0.58161	6.92048
	B->Y (RF)	0.02955	0.57041	6.90231
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.03651	0.57002	6.21113
	B->Y (RF)	0.03114	0.56128	6.19593

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	0.00532	0.00524	0.00532
	B	0.00000	0.00000	0.00000
	B	0.00420	0.00413	0.00459
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00377	0.00372	0.00376
	B	0.00000	0.00000	0.00000
	B	0.00309	0.00301	0.00333

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	0.00063	0.00042	0.00055
	B	0.00000	0.00000	0.00000
	B	-0.00057	-0.00060	-0.00048
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00038	0.00026	0.00039
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00035	-0.00024

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)	-0.00199	-0.00232	-0.00234
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00136	-0.00155	-0.00155

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)	0.00233	0.00236	0.00234
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00155	0.00156	0.00155

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)	-0.00122	-0.00123	-0.00122
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00080	-0.00080	-0.00080

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)	0.00129	0.00130	0.00125
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00084	0.00084	0.00081

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00384	0.00392	0.00328	0.68868

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.01713	0.08060

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)	0.08496	1.01626	11.40110
	A1->Y (FR)	0.10582	1.05734	11.52810
	B0->Y (FR)	0.05525	0.88255	10.31640

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)	0.05794	0.71960	8.14227
	A1->Y (RF)	0.06835	0.71164	7.96143
	B0->Y (RF)	0.04567	0.73406	8.60469

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	0.00566	0.00542	0.00596
	A1	0.00000	0.00000	0.00000
	A1	0.00681	0.00671	0.00676
	B0	0.00455	0.00446	0.00476

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	0.00020	0.00011	0.00016
	A1	0.00000	0.00000	0.00000
	A1	0.00140	0.00119	0.00123
	B0	0.00193	0.00183	0.00190

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)	-0.00123	-0.00125	-0.00123
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00231	-0.00236	-0.00235
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00239	-0.00241	-0.00240

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)	0.00130	0.00130	0.00125
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00234	0.00236	0.00235
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00239	0.00241	0.00241

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)	-0.00194	-0.00227	-0.00229
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00228	-0.00234	-0.00233
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00236	-0.00238	-0.00237

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)	0.00227	0.00230	0.00229
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00231	0.00234	0.00233
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00236	0.00239	0.00237

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)	-0.00189	-0.00191	-0.00194

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)	0.00194	0.00195	0.00195

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00371	0.00394	0.00406	0.00397	0.70206

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.03900	0.13951

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)	0.11489	1.05876	11.50220
	A1->Y (FR)	0.09782	1.02119	11.38760
	B0->Y (FR)	0.06786	0.98991	11.36540
	B1->Y (FR)	0.08625	1.02814	11.48140

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)	0.09471	0.77229	8.31215
	A1->Y (RF)	0.07706	0.74815	8.25172
	B0->Y (RF)	0.06503	0.76143	8.71207
	B1->Y (RF)	0.08349	0.78789	8.80322

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	0.00878	0.00868	0.00872
	A1	0.00760	0.00731	0.00787
	B0	0.00560	0.00535	0.00593
	B1	0.00683	0.00674	0.00679

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00225	0.00206	0.00206
	A1	0.00115	0.00103	0.00104
	B0	0.00115	0.00103	0.00111
	B1	0.00227	0.00205	0.00214

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)	-0.00199	-0.00232	-0.00234
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00199	-0.00232	-0.00234
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00230	-0.00234	-0.00233
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00237	-0.00239	-0.00238

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)	0.00232	0.00235	0.00234
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00232	0.00235	0.00234
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00233	0.00235	0.00233
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00237	0.00239	0.00238

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)	-0.00121	-0.00122	-0.00122
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00121	-0.00122	-0.00122
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00227	-0.00232	-0.00231
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00235	-0.00236	-0.00236

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)	0.00128	0.00129	0.00124
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00128	0.00129	0.00124
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00230	0.00232	0.00231
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00235	0.00237	0.00236

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)	-0.00120	-0.00121	-0.00121
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00120	-0.00121	-0.00121
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00257	-0.00261	-0.00260
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00257	-0.00259	-0.00264

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)	0.00127	0.00128	0.00123
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00127	0.00128	0.00123
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00260	0.00261	0.00260
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00264	0.00266	0.00265

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)	-0.00196	-0.00228	-0.00230
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00196	-0.00228	-0.00230
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00263	-0.00267	-0.00266
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00263	-0.00264	-0.00269

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)	0.00227	0.00228	0.00230
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00227	0.00232	0.00230
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00266	0.00270	0.00266
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00270	0.00271	0.00271

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00418	0.00394	1.43976
sky130_osu_sc_15T_ms__or2_2	0.00418	0.00394	2.85266
sky130_osu_sc_15T_ms__or2_4	0.00418	0.00394	5.49903
sky130_osu_sc_15T_ms__or2_8	0.00418	0.00395	10.54298
sky130_osu_sc_15T_ms__or2_l	0.00320	0.00294	0.82561

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.04356	0.07008
sky130_osu_sc_15T_ms__or2_2	0.00000	0.06112	0.13983
sky130_osu_sc_15T_ms__or2_4	0.00000	0.09624	0.27934
sky130_osu_sc_15T_ms__or2_8	0.00000	0.16648	0.55836
sky130_osu_sc_15T_ms__or2_l	0.00000	0.00727	0.01131

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)	0.08683	0.75891	7.63638
	B->Y (RR)	0.07680	0.72520	7.49192
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.09587	0.68732	7.80490
	B->Y (RR)	0.08534	0.65896	7.67767
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.12585	0.68186	8.17135
	B->Y (RR)	0.11535	0.66126	8.06695
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.18359	0.73620	8.69208
	B->Y (RR)	0.17285	0.72043	8.57965
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.09645	0.86772	7.47913
	B->Y (RR)	0.08732	0.83700	7.34513

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)	0.15420	0.80551	7.13404
	B->Y (FF)	0.13126	0.75940	6.79033
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.18626	0.79310	7.45053
	B->Y (FF)	0.16353	0.75490	7.10381
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.26558	0.85548	7.98866
	B->Y (FF)	0.24285	0.82668	7.66580
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.42380	1.02493	8.61547
	B->Y (FF)	0.40112	0.99037	8.31764
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.18170	0.82065	6.03822
	B->Y (FF)	0.15568	0.78305	5.77045

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	0.00425	0.00368	0.00546
	B	0.00000	0.00000	0.00000
	B	0.00312	0.00273	0.00530
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00713	0.00680	0.00871
	B	0.00000	0.00000	0.00000
	B	0.00594	0.00586	0.00863
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01342	0.01359	0.01526
	B	0.00000	0.00000	0.00000
	B	0.01227	0.01280	0.01532
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02609	0.02692	0.02912
	B	0.00000	0.00000	0.00000
	B	0.02485	0.02639	0.02860
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00304	0.00272	0.00404
	B	0.00000	0.00000	0.00000
	B	0.00233	0.00205	0.00393

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	0.00888	0.00873	0.00989
	B	0.00000	0.00000	0.00000
	B	0.00749	0.00757	0.01122
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01079	0.01112	0.01216
	B	0.00000	0.00000	0.00000
	B	0.00941	0.00990	0.01329
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01557	0.01669	0.01782
	B	0.00000	0.00000	0.00000
	B	0.01417	0.01537	0.01881
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02558	0.02753	0.02939
	B	0.00000	0.00000	0.00000
	B	0.02413	0.02613	0.02992
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00660	0.00635	0.00728
	B	0.00000	0.00000	0.00000
	B	0.00562	0.00560	0.00792

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)	-0.00200	-0.00233	-0.00236
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00233	-0.00236
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00233	-0.00236
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00233	-0.00236
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00137	-0.00157	-0.00157

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)	0.00234	0.00236	0.00236
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00234	0.00236	0.00236
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00234	0.00236	0.00236
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00234	0.00236	0.00236
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00157	0.00159	0.00157

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)	-0.00122	-0.00125	-0.00123
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00122	-0.00125	-0.00123
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00123	-0.00125	-0.00123
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00123	-0.00125	-0.00123
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00082	-0.00083	-0.00082

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)	0.00131	0.00130	0.00125
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00131	0.00131	0.00125
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00131	0.00130	0.00125
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00131	0.00130	0.00125
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00086	0.00087	0.00083

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00409	0.00527	0.71550
sky130_osu_sc_15T_ms__tbufi_l	0.00311	0.00404	0.44177

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.03508	0.13951
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00570	0.02168

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)	0.05770	0.98079	11.41190
	OE->Y (FR)	0.05352	0.32487	4.44552
	OE->Y (RR)	0.10309	0.89131	7.58461
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.07746	1.13875	11.55860
	OE->Y (FR)	0.06284	0.32464	4.44520
	OE->Y (RR)	0.11838	1.02456	7.47366

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)	0.04093	0.70478	8.39019
	OE->Y (FF)	0.05450	0.32490	4.44549
	OE->Y (RF)	0.04031	0.68840	8.10719
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.04455	0.69881	7.53406
	OE->Y (FF)	0.06425	0.32473	4.44521
	OE->Y (RF)	0.04275	0.67973	7.19371

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	0.00391	0.00367	0.00426
	OE	0.00000	0.00000	0.00000
	OE	0.00377	0.00341	0.00652
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00281	0.00309
	OE	0.00000	0.00000	0.00000
	OE	0.00267	0.00232	0.00469

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	-0.00057	-0.00060	-0.00049
	OE	0.00000	0.00000	0.00000
	OE	0.00253	0.00208	0.00560
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00032	-0.00035	-0.00024
	OE	0.00000	0.00000	0.00000
	OE	0.00171	0.00137	0.00388

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)	-0.00196	-0.00199	-0.00197
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00178	-0.00178	-0.00177
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00140	-0.00143	-0.00141
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00128	-0.00128	-0.00128

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)	0.00196	0.00199	0.00197
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00182	0.00184	0.00180
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00140	0.00143	0.00141
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00131	0.00131	0.00129

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)	0.00148	0.00104	0.00459
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00131	0.00097	0.00440
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00097	0.00063	0.00318
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00086	0.00060	0.00305

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)	0.00462	0.00427	0.00837
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00464	0.00437	0.00845
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00352	0.00325	0.00600
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00357	0.00333	0.00607

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00408	0.00624	0.72404
sky130_osu_sc_15T_ms__tnbufi_l	0.00310	0.00450	0.44183

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.05828	0.06992
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.00924	0.01108

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)	0.05844	0.98535	11.49500
	OE->Y (RR)	0.03400	0.32473	4.44601
	OE->Y (FR)	0.07159	1.01469	11.60840
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.07811	1.13869	11.55930
	OE->Y (RR)	0.03366	0.32467	4.44581
	OE->Y (FR)	0.08916	1.15903	11.53560

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)	0.04020	0.70720	8.43965
	OE->Y (RF)	0.03357	0.32474	4.44595
	OE->Y (FF)	0.07259	0.65495	5.43044
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.04362	0.69842	7.53420
	OE->Y (RF)	0.03328	0.32467	4.44587
	OE->Y (FF)	0.08356	0.67986	4.84064

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	0.00402	0.00378	0.00439
	OE	0.00000	0.00000	0.00000
	OE	0.00958	0.00937	0.01406
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00301	0.00293	0.00321
	OE	0.00000	0.00000	0.00000
	OE	0.00692	0.00686	0.00987

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	-0.00072	-0.00075	-0.00063
	OE	0.00000	0.00000	0.00000
	OE	0.00851	0.00853	0.01265
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00047	-0.00049	-0.00039
	OE	0.00000	0.00000	0.00000
	OE	0.00608	0.00602	0.00883

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)	-0.00167	-0.00170	-0.00167
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00150	-0.00150	-0.00150
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00112	-0.00113	-0.00113
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00100	-0.00101	-0.00101

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)	0.00167	0.00170	0.00167
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00154	0.00155	0.00152
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00112	0.00113	0.00113
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00104	0.00103	0.00102

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)	-0.00266	-0.00342	0.00037
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00268	-0.00331	0.00039
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00172	-0.00219	0.00042
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00170	-0.00216	0.00044

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)	0.00729	0.00732	0.01174
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00716	0.00719	0.01162
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00522	0.00520	0.00816
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00515	0.00513	0.00808

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00810	0.00718	0.73747

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.12111	0.20943

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.13072	0.94318	7.89008
	A->Y (FR)	!B	0.07692	1.01342	11.59110
	B->Y (RR)	A	0.10562	0.91413	7.83273
	B->Y (FR)	!A	0.09911	1.04819	11.70250

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.12176	0.75245	5.79535
	A->Y (RF)	!B	0.05705	0.70997	8.24185
	B->Y (FF)	A	0.10669	0.73622	5.78392
	B->Y (RF)	!A	0.06932	0.72611	8.25412

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	0.00380	0.00322	0.00620
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00970	0.00948	0.01405
	B	A	0.00000	0.00000	0.00000
	B	A	0.00158	0.00123	0.00461
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01037	0.01013	0.01444

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	0.01186	0.01141	0.01526
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00261	0.00206	0.00540
	B	A	0.00000	0.00000	0.00000
	B	A	0.01059	0.01063	0.01471
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00356	0.00293	0.00628

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.00814	0.00723	0.72047

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.12111	0.20411

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	0.12992	0.93256	7.79114
	A->Y (FR)	B	0.09305	1.03972	11.65650
	B->Y (RR)	!A	0.11061	0.92019	7.79087
	B->Y (FR)	A	0.10148	1.05025	11.65270

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	0.11250	0.74015	5.70727
	A->Y (RF)	B	0.05790	0.73124	8.44011
	B->Y (FF)	!A	0.10484	0.73196	5.69867
	B->Y (RF)	A	0.06797	0.72280	8.16276

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	0.01122	0.01098	0.01524
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00220	0.00128	0.00443
	B	A	0.00000	0.00000	0.00000
	B	A	0.01145	0.01124	0.01553
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00145	0.00105	0.00443

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	0.00241	0.00171	0.00504
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01207	0.01199	0.01579
	B	A	0.00000	0.00000	0.00000
	B	A	0.00242	0.00174	0.00508
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01077	0.01086	0.01490

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
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	0.36545
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	136406.00000	272812.00000
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
	-0.00168	0.03014	0.41946

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
	2.37434	2.24559	0.52530