sky130_osu_sc_15T_ms_tt_1P44_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_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.01476	0.01478	0.01140	1.33583	0.59799	1.30039
sky130_osu_sc_15T_ms__addf_l	0.01475	0.01477	0.01139	0.80749	0.59845	0.83467

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.13514	0.17379
sky130_osu_sc_15T_ms__addf_l	0.00000	0.08651	0.12515

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)	0.21023	2.13653	27.42280
	B->CO (RR)	0.18909	2.06043	26.59710
	CI->CO (RR)	0.19904	2.14368	27.70870
	CON->CO (FR)	0.03568	0.87532	11.87940
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.21794	1.96755	21.22580
	B->CO (RR)	0.19748	1.90590	20.71990
	CI->CO (RR)	0.20668	1.97617	21.54240
	CON->CO (FR)	0.04659	0.99651	12.01250

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)	0.31293	2.85101	36.16190
	B->CO (FF)	0.28289	2.74184	34.92780
	CI->CO (FF)	0.27868	2.79712	36.00150
	CON->CO (RF)	0.03001	0.71984	9.74617
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.30134	2.36431	24.97650
	B->CO (FF)	0.27261	2.27998	24.23690
	CI->CO (FF)	0.26692	2.31022	24.84460
	CON->CO (RF)	0.03208	0.70331	8.64233

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)	0.21952	1.22890	11.81260
	B->CON (FR)	0.19020	1.16490	11.48610
	CI->CON (FR)	0.18507	1.17589	11.70420
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.20815	1.21794	11.80520
	B->CON (FR)	0.17964	1.15457	11.48040
	CI->CON (FR)	0.17353	1.16478	11.69850

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)	0.12588	0.79998	8.09786
	B->CON (RF)	0.12084	0.78483	8.14738
	CI->CON (RF)	0.11458	0.80941	8.44852
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.12055	0.79483	8.09560
	B->CON (RF)	0.11582	0.78246	8.14527
	CI->CON (RF)	0.10923	0.80423	8.44631

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)	0.44733	2.69467	28.57310
	B->S (-R)	0.45391	2.67277	28.03100
	CI->S (-R)	0.41011	2.63299	28.39370
	CON->S (RR)	0.11430	0.85993	8.26716
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.43109	2.44198	22.81530
	B->S (-R)	0.43780	2.43552	22.55060
	CI->S (-R)	0.39359	2.38141	22.66040
	CON->S (RR)	0.11819	0.94771	8.24793

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)	0.35901	1.99151	20.09090
	B->S (-F)	0.36259	1.92849	19.53010
	CI->S (-F)	0.34664	1.99367	20.36460
	CON->S (FF)	0.14814	0.84592	7.18412
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.33471	1.74537	15.61050
	B->S (-F)	0.33871	1.69619	15.28370
	CI->S (-F)	0.32220	1.74891	15.91110
	CON->S (FF)	0.13359	0.83504	6.38477

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	0.00250	0.00237	0.00297
	B	0.00305	0.00303	0.00374
	CI	0.00305	0.00316	0.00402
sky130_osu_sc_15T_ms__addf_l	A	0.00198	0.00178	0.00209
	B	0.00254	0.00243	0.00277
	CI	0.00254	0.00255	0.00301

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00832	0.00835	0.00939
	B	0.00818	0.00834	0.00941
	CI	0.00722	0.00747	0.00859
sky130_osu_sc_15T_ms__addf_l	A	0.00783	0.00781	0.00831
	B	0.00768	0.00779	0.00831
	CI	0.00672	0.00693	0.00751

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00831	0.00832	0.00857
	B	0.00816	0.00829	0.00854
	CI	0.00720	0.00741	0.00777
sky130_osu_sc_15T_ms__addf_l	A	0.00782	0.00780	0.00806
	B	0.00768	0.00778	0.00803
	CI	0.00671	0.00690	0.00725

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00246	0.00232	0.00251
	B	0.00302	0.00296	0.00317
	CI	0.00304	0.00310	0.00343
sky130_osu_sc_15T_ms__addf_l	A	0.00195	0.00176	0.00194
	B	0.00251	0.00240	0.00259
	CI	0.00253	0.00255	0.00285

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00832	0.00835	0.00930
	B	0.00818	0.00834	0.00935
	CI	0.00721	0.00747	0.00851
sky130_osu_sc_15T_ms__addf_l	A	0.00783	0.00782	0.00836
	B	0.00769	0.00780	0.00835
	CI	0.00672	0.00693	0.00754

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01702	0.01716	0.01737
	B	0.01544	0.01514	0.01682
	CI	0.01393	0.01394	0.01427
sky130_osu_sc_15T_ms__addf_l	A	0.01631	0.01628	0.01651
	B	0.01477	0.01438	0.01612
	CI	0.01324	0.01316	0.01353

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00728	0.00802	1.31032	0.64345	1.35355
sky130_osu_sc_15T_ms__addh_l	0.00728	0.00802	0.83653	0.65173	0.85878

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.15154	0.17365
sky130_osu_sc_15T_ms__addh_l	0.00000	0.09071	0.12501

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)	0.14377	0.88682	8.14684
	B->CO (RR)	0.14828	0.88799	8.29241
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.14957	0.97929	8.16483
	B->CO (RR)	0.15413	0.98240	8.31052

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)	0.12147	0.80216	7.09065
	B->CO (FF)	0.12809	0.81610	7.15201
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.11471	0.74518	5.72152
	B->CO (FF)	0.12118	0.75959	5.78704

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	0.19293	0.75202	4.68267
	A->CON (FR)	!B	0.12438	1.09960	11.69290
	B->CON (RR)	A	0.19742	0.75178	4.82043
	B->CON (FR)	!A	0.15038	1.14661	11.86740
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.17758	0.73275	4.64978
	A->CON (FR)	!B	0.11360	1.09357	11.77170
	B->CON (RR)	A	0.18232	0.73502	4.78466
	B->CON (FR)	!A	0.13955	1.14062	11.94750

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	0.18582	0.88844	6.31489
	A->CON (RF)	!B	0.07560	0.77293	8.58588
	B->CON (FF)	A	0.18464	0.91520	6.58084
	B->CON (RF)	!A	0.09086	0.77316	8.39397
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.17282	0.86880	6.25850
	A->CON (RF)	!B	0.07050	0.77063	8.63369
	B->CON (FF)	A	0.17147	0.89655	6.53184
	B->CON (RF)	!A	0.08586	0.77093	8.43892

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	0.14925	2.06395	27.53950
	A->S (FR)	B	0.26000	2.16105	25.05310
	B->S (RR)	!A	0.16452	2.02549	26.70860
	B->S (FR)	A	0.25938	2.22732	25.95560
	CON->S (FR)	-	0.03815	0.89479	12.17380
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.15211	1.91321	21.96220
	A->S (FR)	B	0.25526	1.99576	19.42280
	B->S (RR)	!A	0.16768	1.88584	21.40670
	B->S (FR)	A	0.25430	2.05149	20.04910
	CON->S (FR)	-	0.04649	1.00793	12.32650

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	0.20105	2.58961	34.43280
	A->S (RF)	B	0.25101	1.73440	19.15910
	B->S (FF)	!A	0.22700	2.63900	34.66950
	B->S (RF)	A	0.25534	1.73534	19.29800
	CON->S (RF)	-	0.02842	0.70882	9.64998
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.18902	2.18056	24.82960
	A->S (RF)	B	0.23529	1.50585	13.69510
	B->S (FF)	!A	0.21499	2.22847	25.02840
	B->S (RF)	A	0.23974	1.50870	13.84740
	CON->S (RF)	-	0.03043	0.70854	8.80537

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	0.00372	0.00354	0.00359
	B	0.00000	0.00000	0.00000
	B	0.00341	0.00323	0.00310
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00323	0.00301	0.00333
	B	0.00000	0.00000	0.00000
	B	0.00292	0.00271	0.00280

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	0.00571	0.00550	0.00589
	B	0.00000	0.00000	0.00000
	B	0.00591	0.00592	0.00634
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00522	0.00499	0.00543
	B	0.00000	0.00000	0.00000
	B	0.00543	0.00539	0.00585

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	0.00372	0.00354	0.00378
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00499	0.00500	0.00511
	B	A	0.00000	0.00000	0.00000
	B	A	0.00341	0.00324	0.00327
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00552	0.00551	0.00551
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00322	0.00301	0.00331
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00466	0.00464	0.00475
	B	A	0.00000	0.00000	0.00000
	B	A	0.00292	0.00271	0.00299
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00519	0.00515	0.00515

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	0.00571	0.00551	0.00593
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00084	0.00084	0.00086
	B	A	0.00000	0.00000	0.00000
	B	A	0.00590	0.00591	0.00648
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00145	0.00138	0.00139
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00523	0.00500	0.00547
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00039	0.00037	0.00035
	B	A	0.00000	0.00000	0.00000
	B	A	0.00543	0.00538	0.00595
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00100	0.00092	0.00090

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	0.00572	0.00550	0.00599
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00085	0.00087	0.00091
	B	A	0.00000	0.00000	0.00000
	B	A	0.00591	0.00592	0.00649
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00147	0.00142	0.00143
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00524	0.00501	0.00548
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00040	0.00037	0.00040
	B	A	0.00000	0.00000	0.00000
	B	A	0.00543	0.00539	0.00600
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00101	0.00094	0.00092

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	0.00372	0.00354	0.00359
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00500	0.00505	0.00515
	B	A	0.00000	0.00000	0.00000
	B	A	0.00341	0.00323	0.00313
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00553	0.00555	0.00559
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00323	0.00301	0.00338
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00467	0.00467	0.00476
	B	A	0.00000	0.00000	0.00000
	B	A	0.00291	0.00271	0.00287
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00519	0.00517	0.00517

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00390	0.00399	1.32445
sky130_osu_sc_15T_ms__and2_2	0.00390	0.00400	2.64265
sky130_osu_sc_15T_ms__and2_4	0.00390	0.00399	5.05818
sky130_osu_sc_15T_ms__and2_6	0.00393	0.00399	7.47105
sky130_osu_sc_15T_ms__and2_8	0.00390	0.00400	9.60392
sky130_osu_sc_15T_ms__and2_l	0.00297	0.00307	0.81199

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.07233	0.11569
sky130_osu_sc_15T_ms__and2_2	0.00000	0.11570	0.11583
sky130_osu_sc_15T_ms__and2_4	0.00000	0.20242	0.23123
sky130_osu_sc_15T_ms__and2_6	0.00000	0.28915	0.34677
sky130_osu_sc_15T_ms__and2_8	0.00000	0.37588	0.46231
sky130_osu_sc_15T_ms__and2_l	0.00000	0.01151	0.01836

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)	0.10867	0.80796	7.81584
	B->Y (RR)	0.11562	0.82041	7.96423
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.12634	0.75916	8.16018
	B->Y (RR)	0.13315	0.76281	8.29906
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.17562	0.77834	8.58338
	B->Y (RR)	0.18242	0.77351	8.70090
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.22429	0.82504	8.95342
	B->Y (RR)	0.23093	0.81576	9.04637
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.27105	0.87452	9.16408
	B->Y (RR)	0.27782	0.86334	9.24584
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.12218	0.91879	7.74655
	B->Y (RR)	0.12917	0.93022	7.89529

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)	0.09250	0.71999	6.60130
	B->Y (FF)	0.09770	0.74095	6.69646
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.10808	0.69959	6.92805
	B->Y (FF)	0.11359	0.71453	7.01247
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.15277	0.73315	7.33599
	B->Y (FF)	0.15772	0.74230	7.40176
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.19931	0.78123	7.65632
	B->Y (FF)	0.20380	0.78780	7.74331
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.24330	0.82434	7.81565
	B->Y (FF)	0.24725	0.82854	7.88335
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.10650	0.76253	6.04339
	B->Y (FF)	0.11424	0.78291	6.15128

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	0.00286	0.00253	0.00422
	B	0.00000	0.00000	0.00000
	B	0.00291	0.00250	0.00333
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00545	0.00536	0.00677
	B	0.00000	0.00000	0.00000
	B	0.00551	0.00538	0.00600
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01122	0.01153	0.01274
	B	0.00000	0.00000	0.00000
	B	0.01129	0.01165	0.01225
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01698	0.01754	0.01953
	B	0.00000	0.00000	0.00000
	B	0.01706	0.01781	0.01912
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02284	0.02348	0.02622
	B	0.00000	0.00000	0.00000
	B	0.02290	0.02372	0.02587
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00206	0.00183	0.00307
	B	0.00000	0.00000	0.00000
	B	0.00213	0.00180	0.00244

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	0.00697	0.00693	0.00902
	B	0.00000	0.00000	0.00000
	B	0.00786	0.00776	0.00967
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00875	0.00907	0.01109
	B	0.00000	0.00000	0.00000
	B	0.00965	0.00989	0.01174
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01312	0.01425	0.01631
	B	0.00000	0.00000	0.00000
	B	0.01404	0.01497	0.01687
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01765	0.01949	0.02172
	B	0.00000	0.00000	0.00000
	B	0.01851	0.02008	0.02217
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02191	0.02442	0.02702
	B	0.00000	0.00000	0.00000
	B	0.02282	0.02495	0.02731
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00532	0.00523	0.00662
	B	0.00000	0.00000	0.00000
	B	0.00595	0.00582	0.00708

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)	-0.00248	-0.00249	-0.00250
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00248	-0.00249	-0.00250
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00248	-0.00249	-0.00250
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00249	-0.00251	-0.00252
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00247	-0.00249	-0.00250
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00176	-0.00176	-0.00177

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)	0.00251	0.00252	0.00251
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00251	0.00252	0.00251
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00251	0.00252	0.00251
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00253	0.00253	0.00253
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00251	0.00251	0.00251
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00177	0.00178	0.00178

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)	-0.00235	-0.00236	-0.00235
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00235	-0.00235	-0.00235
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00235	-0.00235	-0.00235
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00235	-0.00235	-0.00235
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00234	-0.00236	-0.00235
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00167	-0.00168	-0.00167

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)	0.00236	0.00239	0.00236
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00236	0.00239	0.00236
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00236	0.00239	0.00236
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00236	0.00239	0.00236
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00236	0.00239	0.00236
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00168	0.00168	0.00168

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00366	0.00384	0.00372	0.58394

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.02854	0.05777

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)	0.11756	1.13603	11.73410
	A1->Y (FR)	0.09952	1.08075	11.38920
	B0->Y (FR)	0.08749	1.08693	11.63010

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)	0.06730	0.71590	7.74054
	A1->Y (RF)	0.06118	0.72190	8.00530
	B0->Y (RF)	0.03775	0.64738	7.48258

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	0.00591	0.00585	0.00586
	A1	0.00000	0.00000	0.00000
	A1	0.00498	0.00490	0.00488
	B0	0.00476	0.00465	0.00487

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	0.00132	0.00112	0.00108
	A1	0.00000	0.00000	0.00000
	A1	0.00133	0.00112	0.00112
	B0	-0.00052	-0.00059	-0.00055

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)	-0.00192	-0.00213	-0.00213
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00216	-0.00218	-0.00217
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00217	-0.00217	-0.00217

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)	0.00212	0.00214	0.00213
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00217	0.00222	0.00218
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00218	0.00222	0.00218

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)	-0.00190	-0.00209	-0.00209
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00213	-0.00214	-0.00213
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00231	-0.00234	-0.00234

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)	0.00209	0.00210	0.00209
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00213	0.00217	0.00214
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00233	0.00235	0.00235

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)	-0.00112	-0.00113	-0.00113

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)	0.00125	0.00126	0.00116

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00365	0.00381	0.00396	0.00375	0.59960

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.03179	0.11554

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)	0.14464	1.16555	11.81950
	A1->Y (FR)	0.12943	1.13941	11.71920
	B0->Y (FR)	0.08953	1.07687	11.58470
	B1->Y (FR)	0.10488	1.10534	11.71850

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)	0.08719	0.74360	7.86498
	A1->Y (RF)	0.08099	0.74960	8.12625
	B0->Y (RF)	0.04703	0.71045	8.08745
	B1->Y (RF)	0.05308	0.70336	7.82518

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	0.00728	0.00722	0.00721
	A1	0.00637	0.00627	0.00625
	B0	0.00510	0.00496	0.00517
	B1	0.00598	0.00586	0.00608

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00266	0.00247	0.00239
	A1	0.00268	0.00246	0.00243
	B0	-0.00032	-0.00039	-0.00037
	B1	-0.00028	-0.00036	-0.00037

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)	-0.00194	-0.00212	-0.00213
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00217	-0.00218	-0.00217
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00217	-0.00217	-0.00217
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00217	-0.00217	-0.00217

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)	0.00212	0.00215	0.00213
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00217	0.00222	0.00218
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00218	0.00222	0.00218
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00218	0.00222	0.00218

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)	-0.00191	-0.00209	-0.00209
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00213	-0.00214	-0.00213
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00230	-0.00233	-0.00234
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00230	-0.00233	-0.00234

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)	0.00208	0.00209	0.00209
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00213	0.00217	0.00214
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00233	0.00235	0.00234
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00233	0.00235	0.00234

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)	-0.00113	-0.00114	-0.00113
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00112	-0.00114	-0.00113
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00240	-0.00241	-0.00243
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00240	-0.00241	-0.00243

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)	0.00131	0.00132	0.00118
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00113	0.00114	0.00113
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00242	0.00244	0.00243
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00242	0.00244	0.00243

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)	-0.00113	-0.00114	-0.00114
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00113	-0.00114	-0.00114
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00221	-0.00222	-0.00222
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00221	-0.00222	-0.00222

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)	0.00132	0.00133	0.00119
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00113	0.00114	0.00114
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00222	0.00222	0.00222
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00222	0.00222	0.00222

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00399	1.30763
sky130_osu_sc_15T_ms__buf_2	0.00403	2.59326
sky130_osu_sc_15T_ms__buf_4	0.00403	5.06219
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00403	9.83216
sky130_osu_sc_15T_ms__buf_l	0.00310	0.81499

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.05792	0.05792
sky130_osu_sc_15T_ms__buf_2	0.00000	0.08688	0.11569
sky130_osu_sc_15T_ms__buf_4	0.00000	0.14479	0.23122
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.26062	0.46230
sky130_osu_sc_15T_ms__buf_l	0.00000	0.00929	0.00929

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)	0.07856	0.77010	7.73707
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.08977	0.70546	7.95608
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.12229	0.70412	8.42883
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.18502	0.76639	9.03363
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.09047	0.87160	7.65762

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)	0.08806	0.70872	6.48595
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.10528	0.70372	7.04227
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.15045	0.74141	7.61259
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.24143	0.83140	8.25897
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.10283	0.75496	5.99089

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	0.00271	0.00229	0.00375
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00530	0.00536	0.00633
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01110	0.01124	0.01229
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02255	0.02344	0.02546
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00203	0.00168	0.00278

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	0.00679	0.00666	0.00873
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00861	0.00879	0.01072
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01301	0.01395	0.01588
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02183	0.02397	0.02638
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00522	0.00507	0.00641

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
	-0.00045	-0.00046	-0.00045

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
	0.00045	0.00046	0.00045

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00376	0.00376	0.01117	1.23779	1.23116
sky130_osu_sc_15T_ms__dffr_l	0.00376	0.00376	0.01117	0.81844	0.80847

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.16721	0.28789
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.11858	0.23926

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)	0.48438	1.84339	16.81070
	QN->Q (FR)	0.04389	0.99727	13.30700
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.46876	1.93664	15.89530
	QN->Q (FR)	0.05081	1.08060	13.03630

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)	0.43322	1.89537	18.48190
	QN->Q (RF)	0.03352	0.77399	10.31920
	RN->Q (FF)	0.30851	1.85278	19.16990
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.44405	2.05978	17.78810
	QN->Q (RF)	0.03424	0.75966	9.33275
	RN->Q (FF)	0.31998	2.01628	18.47560

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)	0.37901	1.11002	8.19265
	RN->QN (FR)	0.25394	1.06622	8.88995
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.38382	1.20602	8.26756
	RN->QN (FR)	0.25920	1.16226	8.95285

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)**	0.41530	1.01672	6.05775
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.39020	0.99049	5.39884

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)	-0.09558	-0.12581	-0.60640
	setup	CK (R)	0.38379	0.39475	1.52927
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.09693	-0.12624	-0.60649
	setup	CK (R)	0.38362	0.39663	1.53867

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)	-0.16831	-0.48396	-3.97456
	setup	CK (R)	0.20484	0.49961	4.00590
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.16659	-0.48360	-3.97588
	setup	CK (R)	0.20468	0.49958	4.00591

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)	-0.09558	-0.12581	-0.60640
	setup	CK (R)	0.38379	0.39475	1.52927
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.09693	-0.12624	-0.60649
	setup	CK (R)	0.38362	0.39663	1.53867

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)	-0.16831	-0.48396	-3.97456
	setup	CK (R)	0.20484	0.49961	4.00590
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.16659	-0.48360	-3.97588
	setup	CK (R)	0.20468	0.49958	4.00591

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)	0.32594	0.34227	1.39694
	removal	CK (R)	-0.06927	-0.07800	-0.17867
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.32684	0.34455	1.40557
	removal	CK (R)	-0.06927	-0.07800	-0.17572

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)	0.32594	0.34227	1.39694
	removal	CK (R)	-0.06927	-0.07800	-0.17867
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.32684	0.34455	1.40557
	removal	CK (R)	-0.06927	-0.07800	-0.17572

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 ()	0.18297	0.51514	13.33370
	min_pulse_width	RN ()	0.18297	0.51514	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.17911	0.51514	13.33370
	min_pulse_width	RN ()	0.17911	0.51514	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 ()	0.22546	0.51514	13.33370
	min_pulse_width	CK ()	0.24091	0.51514	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.20615	0.51514	13.33370
	min_pulse_width	CK ()	0.23318	0.51514	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 ()	0.47081	0.52609	13.33370
	min_pulse_width	CK ()	0.17139	0.51514	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.47277	0.52828	13.33370
	min_pulse_width	CK ()	0.16752	0.51514	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	0.00694	0.00569	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00613	0.00512	0.00036

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	0.00773	0.00658	0.00000
	RN	-0.00093	-0.04692	-0.64167
	RN	0.01760	0.01652	0.00638
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00690	0.00613	0.00184
	RN	-0.00093	-0.03661	-0.42428
	RN	0.01676	0.01605	0.01188

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	0.00772	0.00659	0.00000
	RN	-0.00093	-0.04677	-0.63823
	RN	0.01760	0.01653	0.00631
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00690	0.00613	0.00188
	RN	-0.00093	-0.03634	-0.41911
	RN	0.01676	0.01606	0.01189

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	0.00691	0.00566	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00609	0.00509	0.00048

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	-0.00180	-0.00210	-0.00212
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00821	0.00776	0.00810
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00350	0.00310	0.00355
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00180	-0.00210	-0.00212
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00821	0.00776	0.00810
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00350	0.00310	0.00355

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	0.00210	0.00213	0.00212
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01316	0.01294	0.01335
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00629	0.00612	0.00658
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00210	0.00213	0.00212
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01316	0.01294	0.01335
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00629	0.00612	0.00658

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)	0.00256	0.00209	0.00343
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00750	0.00683	0.00802
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)	0.00256	0.00209	0.00343
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00750	0.00682	0.00802

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)	0.00645	0.00619	0.00821
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01326	0.01277	0.01452
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)	0.00645	0.00618	0.00821
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01326	0.01277	0.01452

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)	-0.00040	-0.00093	0.00026
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00400	0.00304	0.00405
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00066	-0.00126	0.00001
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00040	-0.00093	0.00026
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00400	0.00304	0.00405
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00066	-0.00126	0.00001

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)	0.01011	0.00979	0.01176
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02095	0.02019	0.02151
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01582	0.01536	0.01695
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02067	0.01999	0.02391
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01108	0.01075	0.01266
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01011	0.00979	0.01176
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02095	0.02018	0.02151
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01582	0.01535	0.01695
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02067	0.01998	0.02391
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01108	0.01076	0.01266

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00372	0.00376	0.00832	0.01151	1.33434	1.34630
sky130_osu_sc_15T_ms__dffsr_l	0.00372	0.00376	0.00831	0.01151	0.80933	0.81066

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.20798	0.28777
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.15935	0.23914

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)	0.46095	1.83803	17.53320
	QN->Q (FR)	0.03881	0.93281	12.67000
	RN->Q (RR)	0.37155	1.76824	17.59810
	SN->Q (FR)	0.34001	1.81778	18.88430
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.46019	1.92607	15.79720
	QN->Q (FR)	0.05086	1.07454	12.93190
	RN->Q (RR)	0.37137	1.85619	15.85480
	SN->Q (FR)	0.33962	1.90503	17.09630

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)	0.50446	1.96765	18.96400
	QN->Q (RF)	0.03322	0.79346	10.76410
	RN->Q (FF)	0.32244	1.86788	19.68440
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.52247	2.13443	17.69800
	QN->Q (RF)	0.03417	0.75634	9.27586
	RN->Q (FF)	0.34140	2.03678	18.40950

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)	0.45001	1.17704	8.33932
	RN->QN (FR)	0.26944	1.07788	9.06056
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.46053	1.29129	8.38262
	RN->QN (FR)	0.28026	1.19288	9.09345

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)	0.39885	1.02184	6.56641
	RN->QN (RF)	0.30977	0.95192	6.63536
	SN->QN (FF)	0.27827	1.00194	7.91146
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.38555	0.99069	5.48206
	RN->QN (RF)	0.29691	0.92173	5.54529
	SN->QN (FF)	0.26531	0.97021	6.78181

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)	-0.10014	-0.13260	-0.68988
	setup	CK (R)	0.34997	0.35836	1.54675
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09941	-0.13345	-0.68997
	setup	CK (R)	0.35075	0.36110	1.54762

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)	-0.19781	-0.51367	-4.21811
	setup	CK (R)	0.25295	0.52833	4.24200
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.19713	-0.51297	-4.21610
	setup	CK (R)	0.25117	0.53020	4.24032

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)	-0.10014	-0.13260	-0.68988
	setup	CK (R)	0.34997	0.35836	1.54675
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09941	-0.13345	-0.68997
	setup	CK (R)	0.35075	0.36110	1.54762

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)	-0.19781	-0.51367	-4.21811
	setup	CK (R)	0.25295	0.52833	4.24200
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.19713	-0.51297	-4.21610
	setup	CK (R)	0.25117	0.53020	4.24032

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)	0.26819	0.28264	1.32063
	removal	CK (R)	-0.03319	-0.03974	-0.12137
	hold	SN (R)	-0.27596	-0.52531	-3.26334
	setup	SN (R)	0.30389	0.57854	5.36631
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.26746	0.27894	1.32315
	removal	CK (R)	-0.03319	-0.03974	-0.12137
	hold	SN (R)	-0.26458	-0.51280	-3.16200
	setup	SN (R)	0.30029	0.56525	5.24317

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)	0.26819	0.28264	1.32063
	removal	CK (R)	-0.03319	-0.03974	-0.12137
	hold	SN (R)	-0.27719	-0.52531	-3.26334
	hold	SN (R)	-0.27596	-0.52531	-3.27522
	setup	SN (R)	0.30389	0.57595	5.20639
	setup	SN (R)	0.29974	0.57854	5.36631
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.26746	0.27894	1.32315
	removal	CK (R)	-0.03319	-0.03974	-0.12137
	hold	SN (R)	-0.26722	-0.51280	-3.16200
	hold	SN (R)	-0.26458	-0.51392	-3.17422
	setup	SN (R)	0.30029	0.56435	5.05592
	setup	SN (R)	0.28530	0.56525	5.24317

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 ()	0.20615	0.51514	13.33370
	min_pulse_width	RN ()	0.21387	0.51514	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.20615	0.51514	13.33370
	min_pulse_width	RN ()	0.20615	0.51514	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)	0.05914	0.09714	2.46441
	removal	CK (R)	-0.01978	-0.06853	-0.55988
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05796	0.09696	2.35049
	removal	CK (R)	-0.01978	-0.06853	-0.56282

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)	0.05914	0.09714	2.46441
	removal	CK (R)	-0.01978	-0.06853	-0.55988
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.05796	0.09696	2.35049
	removal	CK (R)	-0.01978	-0.06853	-0.56282

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 ()	0.26645	0.56769	13.33370
	min_pulse_width	SN ()	0.27072	0.56769	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.26685	0.55017	13.33370
	min_pulse_width	SN ()	0.25541	0.55236	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 ()	0.21001	0.51514	13.33370
	min_pulse_width	CK ()	0.26408	0.51514	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.19842	0.51514	13.33370
	min_pulse_width	CK ()	0.26022	0.51514	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 ()	0.44175	0.51514	13.33370
	min_pulse_width	CK ()	0.22546	0.51514	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.43789	0.51514	13.33370
	min_pulse_width	CK ()	0.22160	0.51514	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	0.00856	0.00724	-0.00209
	RN	0.01563	0.01452	0.00175
	SN	-0.00093	-0.04908	-0.69172
	SN	0.01713	0.01604	0.00323
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00783	0.00685	0.00217
	RN	0.01490	0.01411	0.00808
	SN	-0.00093	-0.03636	-0.41956
	SN	0.01639	0.01563	0.00978

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	0.00897	0.00827	0.00209
	RN	-0.00093	-0.04908	-0.69172
	RN	0.01832	0.01755	0.01156
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00821	0.00752	0.00336
	RN	-0.00093	-0.03636	-0.41956
	RN	0.01754	0.01679	0.01283

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	0.00896	0.00826	0.00194
	RN	-0.00093	-0.04934	-0.69791
	RN	0.01832	0.01754	0.01139
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00821	0.00753	0.00332
	RN	-0.00093	-0.03640	-0.42025
	RN	0.01754	0.01678	0.01281

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	0.00852	0.00721	-0.00194
	RN	0.01560	0.01448	0.00173
	SN	-0.00093	-0.04934	-0.69789
	SN	0.01709	0.01599	0.00309
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00779	0.00681	0.00221
	RN	0.01485	0.01407	0.00863
	SN	-0.00093	-0.03640	-0.42023
	SN	0.01635	0.01560	0.00975

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	-0.00207	-0.00212	-0.00211
	(!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)	0.01050	0.01009	0.01043
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00396	0.00358	0.00400
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00395	0.00359	0.00400
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00400	0.00361	0.00404
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00207	-0.00212	-0.00211
	(!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)	0.01050	0.01009	0.01043
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00396	0.00358	0.00400
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00395	0.00359	0.00400
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00400	0.00361	0.00404

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	0.00211	0.00213	0.00211
	(!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)	0.01519	0.01496	0.01516
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00673	0.00659	0.00705
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00678	0.00662	0.00706
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00670	0.00655	0.00700
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00211	0.00213	0.00211
	(!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)	0.01519	0.01494	0.01516
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00673	0.00658	0.00702
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00677	0.00662	0.00705
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00669	0.00654	0.00699

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)	0.00246	0.00201	0.00319
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00922	0.00856	0.00959
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)	0.00246	0.00200	0.00319
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00922	0.00856	0.00959

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)	0.00699	0.00676	0.00882
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01408	0.01353	0.01528
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)	0.00698	0.00675	0.00881
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01407	0.01352	0.01527

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)	-0.00489	-0.00495	-0.00496
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00489	-0.00524	-0.00525
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00479	-0.00497	-0.00497
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00322	0.00278	0.00336
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)	-0.00489	-0.00495	-0.00496
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00487	-0.00522	-0.00523
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00479	-0.00497	-0.00497
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00323	0.00278	0.00336

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)	0.00495	0.00499	0.00498
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00524	0.00526	0.00525
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00498	0.00499	0.00499
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01082	0.01056	0.01087
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)	0.00495	0.00499	0.00498
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00522	0.00527	0.00524
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00497	0.00499	0.00498
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01081	0.01055	0.01087

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)	-0.00040	-0.00093	0.00026
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00460	0.00371	0.00473
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00452	0.00365	0.00468
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00053	-0.00110	0.00015
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00301	0.00193	0.00461
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00040	-0.00093	0.00026
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00459	0.00371	0.00472
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00451	0.00364	0.00467
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00053	-0.00110	0.00015
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00301	0.00193	0.00461

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)	0.02339	0.02265	0.02398
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01014	0.00985	0.01179
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01613	0.01569	0.01726
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01617	0.01576	0.01731
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02266	0.02190	0.02563
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01098	0.01065	0.01257
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01342	0.01285	0.01681
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02339	0.02265	0.02398
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01014	0.00985	0.01179
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01613	0.01569	0.01726
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01616	0.01576	0.01731
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02266	0.02189	0.02564
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01098	0.01065	0.01256
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01342	0.01285	0.01681

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00374	0.00665	0.01129	1.24426	1.23622
sky130_osu_sc_15T_ms__dffs_l	0.00374	0.00665	0.01129	0.80633	0.81292

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.14921	0.22968
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.10058	0.18105

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)	0.35167	1.69286	16.71220
	QN->Q (FR)	0.04392	0.99420	13.29020
	SN->Q (FR)	0.27405	1.75457	18.10850
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.34841	1.78867	15.52330
	QN->Q (FR)	0.05079	1.07120	12.88400
	SN->Q (FR)	0.26982	1.84461	16.85980

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)	0.48629	1.95614	18.57630
	QN->Q (RF)	0.03334	0.77239	10.31680
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.49407	2.09928	17.56650
	QN->Q (RF)	0.03410	0.75353	9.24552

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)	0.42927	1.16814	8.25313
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.43165	1.26058	8.34096

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)	0.29083	0.86887	5.93086
	SN->QN (FF)	0.21218	0.93144	7.32909
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.27788	0.85877	5.28944
	SN->QN (FF)	0.19847	0.91560	6.62619

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)	-0.07608	-0.10879	-0.56792
	setup	CK (R)	0.25831	0.27940	1.48306
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07504	-0.10940	-0.56999
	setup	CK (R)	0.25740	0.28113	1.48707

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)	-0.17614	-0.48771	-4.01828
	setup	CK (R)	0.23451	0.50877	4.06146
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.17431	-0.48724	-4.01589
	setup	CK (R)	0.23404	0.50877	4.06146

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)	-0.07608	-0.10879	-0.56792
	setup	CK (R)	0.25831	0.27940	1.48306
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07504	-0.10940	-0.56999
	setup	CK (R)	0.25740	0.28113	1.48707

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)	-0.17614	-0.48771	-4.01828
	setup	CK (R)	0.23451	0.50877	4.06146
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.17431	-0.48724	-4.01589
	setup	CK (R)	0.23404	0.50877	4.06146

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)	0.06338	0.09414	1.74268
	removal	CK (R)	-0.02011	-0.05525	-0.30734
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.06144	0.09145	1.59047
	removal	CK (R)	-0.02273	-0.05604	-0.30682

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)	0.06338	0.09414	1.74268
	removal	CK (R)	-0.02011	-0.05525	-0.30734
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.06144	0.09145	1.59047
	removal	CK (R)	-0.02273	-0.05604	-0.30682

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 ()	0.19381	0.56769	13.33370
	min_pulse_width	SN ()	0.19808	0.56769	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.18757	0.54799	13.33370
	min_pulse_width	SN ()	0.18413	0.55017	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 ()	0.14821	0.51514	13.33370
	min_pulse_width	CK ()	0.25250	0.51514	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.14435	0.51514	13.33370
	min_pulse_width	CK ()	0.24477	0.51514	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 ()	0.34519	0.51514	13.33370
	min_pulse_width	CK ()	0.20615	0.51514	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.34519	0.51514	13.33370
	min_pulse_width	CK ()	0.20615	0.51514	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	0.00695	0.00565	0.00000
	SN	-0.00093	-0.04707	-0.64502
	SN	0.01465	0.01347	0.00275
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00613	0.00510	0.00051
	SN	-0.00093	-0.03628	-0.41800
	SN	0.01381	0.01291	0.00791

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	0.00768	0.00660	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00685	0.00614	0.00203

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00768	0.00661	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00685	0.00614	0.00200

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	0.00692	0.00563	0.00000
	SN	-0.00093	-0.04688	-0.64082
	SN	0.01461	0.01344	0.00305
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00609	0.00506	0.00049
	SN	-0.00093	-0.03646	-0.42139
	SN	0.01377	0.01288	0.00788

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	-0.00210	-0.00216	-0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00798	0.00752	0.00779
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00342	0.00303	0.00345
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00210	-0.00216	-0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00798	0.00752	0.00779
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00342	0.00302	0.00345

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	0.00215	0.00217	0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01295	0.01269	0.01305
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00641	0.00624	0.00674
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00215	0.00217	0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01295	0.01269	0.01305
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00641	0.00624	0.00674

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)	-0.00356	-0.00358	-0.00358
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00271	0.00235	0.00314
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)	-0.00356	-0.00358	-0.00358
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00271	0.00234	0.00314

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)	0.00360	0.00364	0.00360
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00762	0.00730	0.00833
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)	0.00360	0.00363	0.00359
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00762	0.00730	0.00833

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)	-0.00042	-0.00094	0.00024
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00063	-0.00123	0.00005
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00244	0.00133	0.00411
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00042	-0.00094	0.00024
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00063	-0.00123	0.00005
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00244	0.00133	0.00411

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)	0.02081	0.02003	0.02137
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01012	0.00980	0.01177
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02039	0.01959	0.02352
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01104	0.01071	0.01262
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01305	0.01251	0.01655
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02081	0.02003	0.02137
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01012	0.00980	0.01177
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02039	0.01959	0.02351
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01104	0.01071	0.01262
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01305	0.01251	0.01655

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00390	0.01111	1.36427	1.36033
sky130_osu_sc_15T_ms__dff_l	0.00390	0.01111	0.75498	0.75055

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.18774	0.23172
sky130_osu_sc_15T_ms__dff_l	0.00000	0.13910	0.18309

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)	0.28857	1.65404	17.61640
	QN->Q (FR)	0.03855	0.93688	12.79940
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.29918	1.72941	15.02170
	QN->Q (FR)	0.05651	1.13990	13.40060

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)	0.41537	1.88506	19.20500
	QN->Q (RF)	0.03307	0.79645	10.86290
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.44112	2.05405	17.23060
	QN->Q (RF)	0.03420	0.73914	8.96590

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)	0.36359	1.08264	8.28193
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.37935	1.21613	8.22953

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)	0.23413	0.82768	6.36149
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.22940	0.79023	4.92982

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)	-0.06969	-0.10390	-0.58005
	setup	CK (R)	0.19457	0.22290	1.48251
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.06885	-0.10404	-0.58216
	setup	CK (R)	0.19400	0.22097	1.48620

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)	-0.16733	-0.49292	-4.08256
	setup	CK (R)	0.20125	0.50979	4.12243
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.16700	-0.49232	-4.08338
	setup	CK (R)	0.20101	0.50971	4.12622

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 ()	0.12504	0.51514	13.33370
	min_pulse_width	CK ()	0.23705	0.51514	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.12117	0.51514	13.33370
	min_pulse_width	CK ()	0.22932	0.51514	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 ()**	0.28339	0.51514	13.33370
	min_pulse_width	**CK ()**	0.16366	0.51514	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.28339	0.51514	13.33370
	min_pulse_width	**CK ()**	0.16366	0.51514	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	0.00736	0.00590	-0.00094
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00663	0.00556	0.00140

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	0.00781	0.00709	0.00094
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00705	0.00611	-0.00018

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	0.00781	0.00709	0.00086
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00705	0.00612	-0.00012

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	0.00732	0.00587	-0.00086
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00659	0.00553	0.00138

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	-0.00180	-0.00209	-0.00211
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00755	0.00710	0.00749
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00180	-0.00209	-0.00211
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00756	0.00711	0.00749

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	0.00210	0.00213	0.00211
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01344	0.01312	0.01353
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00210	0.00213	0.00211
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01345	0.01313	0.01354

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)	-0.00042	-0.00095	0.00025
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00062	-0.00121	0.00007
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00042	-0.00095	0.00025
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00062	-0.00121	0.00007

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)	0.01006	0.00973	0.01171
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02037	0.01961	0.02103
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02072	0.01989	0.02383
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01097	0.01064	0.01253
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01006	0.00977	0.01171
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02037	0.01961	0.02104
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02073	0.01990	0.02380
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01097	0.01064	0.01253

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00381	1.28730
sky130_osu_sc_15T_ms__inv_10	0.03503	12.00607
sky130_osu_sc_15T_ms__inv_2	0.00720	2.56787
sky130_osu_sc_15T_ms__inv_3	0.01070	3.71207
sky130_osu_sc_15T_ms__inv_4	0.01413	4.99690
sky130_osu_sc_15T_ms__inv_6	0.02117	7.32897
sky130_osu_sc_15T_ms__inv_8	0.02810	9.74070
sky130_osu_sc_15T_ms__inv_l	0.00286	0.74493

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.02896	0.05777
sky130_osu_sc_15T_ms__inv_10	0.00000	0.28958	0.57769
sky130_osu_sc_15T_ms__inv_2	0.00000	0.05792	0.11554
sky130_osu_sc_15T_ms__inv_3	0.00000	0.08688	0.17331
sky130_osu_sc_15T_ms__inv_4	0.00000	0.11583	0.23108
sky130_osu_sc_15T_ms__inv_6	0.00000	0.17375	0.34661
sky130_osu_sc_15T_ms__inv_8	0.00000	0.23167	0.46215
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00464	0.00907

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)**	0.03713	0.87743	11.81020
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.04829	0.60757	11.83080
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02922	0.75419	11.78360
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.03173	0.71063	11.80090
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.03187	0.67443	11.79050
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.03562	0.63819	11.73880
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.04148	0.61697	11.79010
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.04988	1.00618	11.92140

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)**	0.02967	0.71120	9.57635
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.04083	0.50064	9.61883
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02404	0.62531	9.59781
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02607	0.59312	9.68376
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02571	0.56633	9.67210
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.03054	0.53319	9.64420
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03553	0.51318	9.67127
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.03150	0.68560	8.31706

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	0.00352	0.00351	0.00379
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02965	0.03066	0.03365
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00619	0.00566	0.00680
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00951	0.00961	0.01055
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01218	0.01198	0.01365
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01804	0.01843	0.02017
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02388	0.02305	0.02706
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00263	0.00253	0.00276

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	-0.00063	-0.00066	-0.00060
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01158	-0.01104	-0.00896
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00210	-0.00207	-0.00186
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00277	-0.00274	-0.00238
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00434	-0.00419	-0.00365
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00662	-0.00647	-0.00541
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00906	-0.00867	-0.00721
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00039	-0.00043	-0.00039

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.14438	0.14425	0.00779	0.13962

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.05800	0.05800

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)	-	0.02204	0.39115	3.87910
	A1->Y (RR)	-	0.02462	0.39427	3.88304
	S0->Y (RR)	(!A0 * A1)	0.06865	0.39157	1.62710
	S0->Y (FR)	(A0 * !A1)	0.04542	0.48659	3.58959

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)	-	0.02239	0.35577	3.38587
	A1->Y (FF)	-	0.02021	0.35357	3.38015
	S0->Y (FF)	(!A0 * A1)	0.08703	0.45559	2.28077
	S0->Y (RF)	(A0 * !A1)	0.03323	0.39840	2.85743

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	-	-0.00359	-0.00359	-0.00360
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00246	-0.00246	-0.00247
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00443	0.00430	0.00650
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00232	-0.00282	-0.00125

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	-	0.00359	0.00359	0.00360
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00246	0.00246	0.00247
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00076	0.00028	0.00194
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00940	0.00925	0.01128

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)	-0.00091	-0.00091	-0.00091

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)	0.00091	0.00091	0.00091

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)	-0.00108	-0.00108	-0.00108

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)	0.00108	0.00108	0.00108

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)	-0.00080	-0.00129	0.00036
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00077	-0.00128	0.00035

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)	0.00717	0.00692	0.00908
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00666	0.00645	0.00871

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00381	0.00378	1.14527
sky130_osu_sc_15T_ms__nand2_l	0.00286	0.00285	0.74111

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.02897	0.11554
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00465	0.01815

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)	0.03851	0.84829	11.12250
	B->Y (FR)	0.04489	0.84626	10.98520
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.05123	1.00942	11.92080
	B->Y (FR)	0.06046	1.01954	11.90160

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)	0.04561	0.89389	11.62930
	B->Y (RF)	0.05193	0.89021	11.43460
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.04864	0.90096	10.53130
	B->Y (RF)	0.05429	0.89321	10.28560

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	0.00373	0.00371	0.00391
	B	0.00000	0.00000	0.00000
	B	0.00465	0.00459	0.00471
sky130_osu_sc_15T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00275	0.00255	0.00287
	B	0.00000	0.00000	0.00000
	B	0.00342	0.00336	0.00352

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	-0.00040	-0.00047	-0.00041
	B	0.00000	0.00000	0.00000
	B	-0.00036	-0.00043	-0.00040
sky130_osu_sc_15T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00026	-0.00031	-0.00027
	B	0.00000	0.00000	0.00000
	B	-0.00024	-0.00030	-0.00028

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)	-0.00242	-0.00244	-0.00245
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00168	-0.00169	-0.00170

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)	0.00245	0.00245	0.00246
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00170	0.00171	0.00170

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)	-0.00224	-0.00226	-0.00225
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00156	-0.00157	-0.00156

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)	0.00226	0.00227	0.00225
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00158	0.00157	0.00157

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00378	0.00407	0.63701
sky130_osu_sc_15T_ms__nor2_l	0.00276	0.00308	0.39958

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.02168	0.05777
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00370	0.00907

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)	0.08632	1.08440	11.80160
	B->Y (FR)	0.06875	1.04380	11.62780
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.10630	1.23916	11.84870
	B->Y (FR)	0.09083	1.21058	11.81900

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)	0.03895	0.60191	6.99746
	B->Y (RF)	0.03147	0.59121	6.97938
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.03856	0.59100	6.32295
	B->Y (RF)	0.03313	0.58201	6.30753

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	0.00484	0.00478	0.00481
	B	0.00000	0.00000	0.00000
	B	0.00385	0.00368	0.00400
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00344	0.00339	0.00340
	B	0.00000	0.00000	0.00000
	B	0.00284	0.00276	0.00290

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	0.00058	0.00039	0.00043
	B	0.00000	0.00000	0.00000
	B	-0.00050	-0.00054	-0.00051
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00035	0.00024	0.00028
	B	0.00000	0.00000	0.00000
	B	-0.00028	-0.00031	-0.00028

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)	-0.00182	-0.00211	-0.00213
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00124	-0.00141	-0.00141

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)	0.00212	0.00213	0.00213
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00141	0.00142	0.00141

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)	-0.00113	-0.00114	-0.00113
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00074	-0.00074	-0.00074

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)	0.00120	0.00120	0.00116
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00078	0.00078	0.00075

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00380	0.00388	0.00325	0.62621

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.01430	0.06684

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)	0.09477	1.07927	11.70490
	A1->Y (FR)	0.11729	1.12832	11.89200
	B0->Y (FR)	0.06071	0.92625	10.50210

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)	0.06246	0.75405	8.29923
	A1->Y (RF)	0.07337	0.74627	8.12524
	B0->Y (RF)	0.04947	0.76431	8.70503

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	0.00516	0.00491	0.00526
	A1	0.00000	0.00000	0.00000
	A1	0.00619	0.00609	0.00612
	B0	0.00415	0.00405	0.00417

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	0.00021	0.00013	0.00013
	A1	0.00000	0.00000	0.00000
	A1	0.00130	0.00111	0.00110
	B0	0.00178	0.00169	0.00171

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)	-0.00113	-0.00116	-0.00114
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00210	-0.00214	-0.00214
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00218	-0.00219	-0.00218

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)	0.00121	0.00121	0.00116
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00212	0.00214	0.00214
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00218	0.00219	0.00219

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)	-0.00176	-0.00206	-0.00208
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00207	-0.00212	-0.00211
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00215	-0.00216	-0.00215

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)	0.00207	0.00209	0.00208
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00210	0.00214	0.00211
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00215	0.00217	0.00216

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)	-0.00172	-0.00174	-0.00177

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)	0.00177	0.00178	0.00178

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00367	0.00390	0.00403	0.00393	0.63104

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.03252	0.11554

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)	0.12745	1.12677	11.79370
	A1->Y (FR)	0.10890	1.08516	11.61960
	B0->Y (FR)	0.07578	1.05071	11.59280
	B1->Y (FR)	0.09583	1.09243	11.76960

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)	0.10081	0.80663	8.41984
	A1->Y (RF)	0.08244	0.78098	8.35437
	B0->Y (RF)	0.06956	0.78951	8.76115
	B1->Y (RF)	0.08879	0.81515	8.84952

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	0.00797	0.00788	0.00789
	A1	0.00691	0.00678	0.00698
	B0	0.00510	0.00498	0.00522
	B1	0.00620	0.00613	0.00614

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00206	0.00189	0.00185
	A1	0.00106	0.00096	0.00093
	B0	0.00106	0.00096	0.00095
	B1	0.00208	0.00188	0.00188

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)	-0.00182	-0.00211	-0.00213
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00182	-0.00211	-0.00213
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00209	-0.00213	-0.00212
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00215	-0.00216	-0.00216

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)	0.00212	0.00214	0.00213
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00212	0.00214	0.00213
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00211	0.00213	0.00212
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00215	0.00217	0.00217

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)	-0.00112	-0.00113	-0.00113
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00112	-0.00113	-0.00113
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00206	-0.00210	-0.00210
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00214	-0.00215	-0.00214

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)	0.00119	0.00120	0.00115
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00119	0.00120	0.00115
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00209	0.00210	0.00210
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00214	0.00216	0.00215

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)	-0.00111	-0.00112	-0.00112
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00112	-0.00112	-0.00112
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00233	-0.00237	-0.00236
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00234	-0.00234	-0.00240

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)	0.00118	0.00119	0.00114
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00118	0.00119	0.00114
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00236	0.00237	0.00236
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00240	0.00242	0.00241

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)	-0.00178	-0.00207	-0.00208
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00178	-0.00206	-0.00208
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00239	-0.00243	-0.00242
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00239	-0.00240	-0.00245

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)	0.00207	0.00210	0.00208
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00207	0.00209	0.00208
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00242	0.00245	0.00242
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00246	0.00247	0.00247

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00414	0.00390	1.31334
sky130_osu_sc_15T_ms__or2_2	0.00414	0.00390	2.59753
sky130_osu_sc_15T_ms__or2_4	0.00414	0.00390	5.00235
sky130_osu_sc_15T_ms__or2_8	0.00413	0.00391	9.59856
sky130_osu_sc_15T_ms__or2_l	0.00317	0.00292	0.74910

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.03623	0.05807
sky130_osu_sc_15T_ms__or2_2	0.00000	0.05078	0.11583
sky130_osu_sc_15T_ms__or2_4	0.00000	0.07989	0.23137
sky130_osu_sc_15T_ms__or2_8	0.00000	0.13810	0.46245
sky130_osu_sc_15T_ms__or2_l	0.00000	0.00613	0.00950

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)	0.09357	0.81390	7.96723
	B->Y (RR)	0.08318	0.77760	7.79558
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.10326	0.73750	8.14304
	B->Y (RR)	0.09248	0.71046	7.99708
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.13590	0.73049	8.51924
	B->Y (RR)	0.12491	0.70959	8.39978
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.19888	0.78515	9.05551
	B->Y (RR)	0.18768	0.76905	8.96700
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.10419	0.92478	7.76219
	B->Y (RR)	0.09471	0.89447	7.60984

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)	0.17215	0.85925	7.32896
	B->Y (FF)	0.14731	0.80702	6.90134
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.20910	0.84726	7.66961
	B->Y (FF)	0.18435	0.80519	7.25490
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.29935	0.92073	8.24550
	B->Y (FF)	0.27459	0.88302	7.86469
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.47906	1.11051	8.89533
	B->Y (FF)	0.45430	1.06899	8.58214
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.20296	0.87155	6.21500
	B->Y (FF)	0.17459	0.82964	5.86716

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	0.00391	0.00339	0.00425
	B	0.00000	0.00000	0.00000
	B	0.00288	0.00249	0.00397
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00653	0.00625	0.00705
	B	0.00000	0.00000	0.00000
	B	0.00547	0.00536	0.00675
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01231	0.01248	0.01327
	B	0.00000	0.00000	0.00000
	B	0.01122	0.01172	0.01283
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02388	0.02473	0.02646
	B	0.00000	0.00000	0.00000
	B	0.02270	0.02388	0.02633
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00280	0.00246	0.00323
	B	0.00000	0.00000	0.00000
	B	0.00215	0.00188	0.00296

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	0.00813	0.00800	0.00844
	B	0.00000	0.00000	0.00000
	B	0.00688	0.00691	0.00892
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00987	0.01019	0.01060
	B	0.00000	0.00000	0.00000
	B	0.00863	0.00900	0.01090
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01423	0.01531	0.01585
	B	0.00000	0.00000	0.00000
	B	0.01298	0.01404	0.01601
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02310	0.02520	0.02649
	B	0.00000	0.00000	0.00000
	B	0.02185	0.02390	0.02639
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00605	0.00584	0.00621
	B	0.00000	0.00000	0.00000
	B	0.00517	0.00511	0.00640

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)	-0.00183	-0.00212	-0.00214
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00183	-0.00212	-0.00214
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00183	-0.00212	-0.00214
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00183	-0.00212	-0.00214
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00126	-0.00143	-0.00143

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)	0.00213	0.00214	0.00214
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00213	0.00214	0.00214
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00213	0.00214	0.00214
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00213	0.00214	0.00214
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00142	0.00143	0.00143

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)	-0.00113	-0.00116	-0.00114
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00113	-0.00116	-0.00114
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00113	-0.00116	-0.00114
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00113	-0.00116	-0.00114
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00076	-0.00077	-0.00076

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)	0.00122	0.00121	0.00116
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00122	0.00116
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00122	0.00116
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00122	0.00116
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00080	0.00081	0.00077

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00405	0.00522	0.64150
sky130_osu_sc_15T_ms__tbufi_l	0.00308	0.00401	0.39485

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.02907	0.11554
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00480	0.01815

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)	0.06457	1.03812	11.62650
	OE->Y (FR)	0.05738	0.32073	4.28334
	OE->Y (RR)	0.11342	0.96190	7.88302
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.08683	1.20129	11.73880
	OE->Y (FR)	0.06788	0.34937	4.28316
	OE->Y (RR)	0.13059	1.10209	7.73393

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)	0.04429	0.73196	8.45126
	OE->Y (FF)	0.05843	0.32190	4.28335
	OE->Y (RF)	0.04368	0.71963	8.20520
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.04811	0.72284	7.59161
	OE->Y (FF)	0.06913	0.35408	4.28312
	OE->Y (RF)	0.04624	0.70689	7.28760

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	0.00358	0.00342	0.00372
	OE	0.00000	0.00000	0.00000
	OE	0.00345	0.00303	0.00466
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00265	0.00257	0.00270
	OE	0.00000	0.00000	0.00000
	OE	0.00244	0.00210	0.00334

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	-0.00050	-0.00054	-0.00051
	OE	0.00000	0.00000	0.00000
	OE	0.00234	0.00189	0.00366
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00028	-0.00032	-0.00029
	OE	0.00000	0.00000	0.00000
	OE	0.00158	0.00125	0.00256

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)	-0.00180	-0.00182	-0.00181
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00163	-0.00165	-0.00164
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00129	-0.00130	-0.00130
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00118	-0.00118	-0.00118

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)	0.00180	0.00182	0.00181
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00169	0.00170	0.00167
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00129	0.00130	0.00130
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00121	0.00122	0.00119

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)	0.00136	0.00090	0.00271
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00121	0.00082	0.00253
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00090	0.00061	0.00188
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00080	0.00048	0.00176

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)	0.00423	0.00385	0.00604
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00426	0.00394	0.00611
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00323	0.00296	0.00443
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00329	0.00303	0.00448

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00405	0.00617	0.64157
sky130_osu_sc_15T_ms__tnbufi_l	0.00308	0.00446	0.39493

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.04828	0.05792
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.00775	0.00929

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)	0.06541	1.03816	11.62730
	OE->Y (RR)	0.03566	0.31808	4.28391
	OE->Y (FR)	0.07936	1.07567	11.79740
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.08757	1.20127	11.74030
	OE->Y (RR)	0.03544	0.31800	4.28384
	OE->Y (FR)	0.09904	1.22659	11.76960

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)	0.04348	0.73163	8.45155
	OE->Y (RF)	0.03548	0.31808	4.28389
	OE->Y (FF)	0.07965	0.69674	5.47763
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.04709	0.72246	7.59203
	OE->Y (RF)	0.03517	0.31804	4.28384
	OE->Y (FF)	0.09178	0.72238	4.92790

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	0.00369	0.00352	0.00382
	OE	0.00000	0.00000	0.00000
	OE	0.00875	0.00864	0.01118
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00276	0.00268	0.00281
	OE	0.00000	0.00000	0.00000
	OE	0.00633	0.00623	0.00790

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	-0.00064	-0.00068	-0.00064
	OE	0.00000	0.00000	0.00000
	OE	0.00780	0.00771	0.01005
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00041	-0.00045	-0.00042
	OE	0.00000	0.00000	0.00000
	OE	0.00557	0.00548	0.00706

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)	-0.00153	-0.00155	-0.00154
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00138	-0.00139	-0.00138
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00103	-0.00104	-0.00104
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00092	-0.00093	-0.00093

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)	0.00153	0.00155	0.00154
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00143	0.00143	0.00141
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00103	0.00104	0.00104
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00096	0.00096	0.00094

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)	-0.00241	-0.00307	-0.00121
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00242	-0.00305	-0.00120
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00154	-0.00201	-0.00066
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00153	-0.00199	-0.00065

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)	0.00666	0.00656	0.00902
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00654	0.00646	0.00890
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00478	0.00471	0.00633
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00471	0.00462	0.00626

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00803	0.00710	0.65625

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.10053	0.17346

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	0.14405	1.01553	8.16313
	A->Y (FR)	!B	0.08595	1.06952	11.76240
	B->Y (RR)	A	0.11674	0.98423	8.09165
	B->Y (FR)	!A	0.10957	1.11082	11.93470

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	0.13229	0.79859	5.90247
	A->Y (RF)	!B	0.06174	0.73874	8.30418
	B->Y (FF)	A	0.11666	0.78192	5.88844
	B->Y (RF)	!A	0.07426	0.75549	8.31890

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	0.00346	0.00294	0.00439
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00889	0.00856	0.01105
	B	A	0.00000	0.00000	0.00000
	B	A	0.00150	0.00113	0.00279
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00947	0.00922	0.01156

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	0.01087	0.01038	0.01241
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00242	0.00187	0.00352
	B	A	0.00000	0.00000	0.00000
	B	A	0.00970	0.00961	0.01183
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00331	0.00269	0.00433

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00806	0.00715	0.63526

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.10053	0.16986

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	0.14316	1.00075	7.98328
	A->Y (FR)	B	0.10320	1.09702	11.80790
	B->Y (RR)	!A	0.12204	0.98623	7.97785
	B->Y (FR)	A	0.11225	1.10879	11.81040

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	0.12346	0.78434	5.79406
	A->Y (RF)	B	0.06217	0.75578	8.43482
	B->Y (FF)	!A	0.11490	0.77553	5.76648
	B->Y (RF)	A	0.07258	0.74970	8.19194

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	0.01026	0.00998	0.01232
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00205	0.00119	0.00270
	B	A	0.00000	0.00000	0.00000
	B	A	0.01046	0.01022	0.01256
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00138	0.00096	0.00264

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	0.00225	0.00156	0.00317
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01105	0.01085	0.01300
	B	A	0.00000	0.00000	0.00000
	B	A	0.00226	0.00161	0.00324
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00986	0.00983	0.01207

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.31628
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	113916.00000	227833.00000
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
	-0.00165	0.02415	0.33460

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
	1.98299	1.87259	0.42343