sky130_osu_sc_15T_ms_tt_1P35_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_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.01452	0.01454	0.01126	1.12589	0.49938	1.09341
sky130_osu_sc_15T_ms__addf_l	0.01452	0.01454	0.01123	0.68550	0.49910	0.68890

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.10188	0.13020
sky130_osu_sc_15T_ms__addf_l	0.00000	0.06560	0.09392

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)	0.24650	2.32856	27.82010
	B->CO (RR)	0.22380	2.24898	27.02990
	CI->CO (RR)	0.23344	2.32943	28.02570
	CON->CO (FR)	0.04181	0.95090	12.17880
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.25505	2.15253	21.71720
	B->CO (RR)	0.23342	2.08700	21.23460
	CI->CO (RR)	0.24228	2.15365	21.95100
	CON->CO (FR)	0.05503	1.08581	12.36220

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)	0.38306	3.21173	37.78740
	B->CO (FF)	0.34934	3.09761	36.60960
	CI->CO (FF)	0.34224	3.14194	37.51170
	CON->CO (RF)	0.03369	0.76174	9.76125
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.36789	2.66037	26.15890
	B->CO (FF)	0.33540	2.57112	25.44670
	CI->CO (FF)	0.32699	2.59077	25.91120
	CON->CO (RF)	0.03594	0.74568	8.71306

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)	0.26351	1.37713	12.34230
	B->CON (FR)	0.23073	1.30835	12.02920
	CI->CON (FR)	0.22281	1.30812	12.11880
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.25022	1.36333	12.32510
	B->CON (FR)	0.21813	1.29542	12.01090
	CI->CON (FR)	0.20930	1.29437	12.10130

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)	0.14304	0.86798	8.31531
	B->CON (RF)	0.13714	0.85005	8.31341
	CI->CON (RF)	0.12991	0.87062	8.58215
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.13702	0.86185	8.30713
	B->CON (RF)	0.13145	0.84438	8.30523
	CI->CON (RF)	0.12387	0.86449	8.57413

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)	0.54381	3.08675	30.29290
	B->S (-R)	0.54923	3.06012	29.83480
	CI->S (-R)	0.49950	3.00867	29.99240
	CON->S (RR)	0.13348	0.96187	8.77809
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.52392	2.76815	23.83210
	B->S (-R)	0.52938	2.75515	23.61630
	CI->S (-R)	0.47930	2.69078	23.55330
	CON->S (RR)	0.13837	1.05470	8.65691

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)	0.42717	2.19851	20.53200
	B->S (-F)	0.43261	2.12546	19.97310
	CI->S (-F)	0.41268	2.19408	20.72670
	CON->S (FF)	0.17166	0.94227	7.50821
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.39718	1.91035	15.77780
	B->S (-F)	0.40357	1.85221	15.45050
	CI->S (-F)	0.38301	1.90577	16.00610
	CON->S (FF)	0.16015	0.91521	6.63988

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	0.00220	0.00209	0.00226
	B	0.00266	0.00263	0.00287
	CI	0.00266	0.00272	0.00303
sky130_osu_sc_15T_ms__addf_l	A	0.00175	0.00158	0.00165
	B	0.00221	0.00212	0.00221
	CI	0.00221	0.00221	0.00236

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00721	0.00723	0.00759
	B	0.00709	0.00721	0.00756
	CI	0.00626	0.00644	0.00683
sky130_osu_sc_15T_ms__addf_l	A	0.00678	0.00677	0.00692
	B	0.00666	0.00674	0.00689
	CI	0.00582	0.00598	0.00617

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00720	0.00719	0.00727
	B	0.00708	0.00717	0.00724
	CI	0.00625	0.00643	0.00651
sky130_osu_sc_15T_ms__addf_l	A	0.00678	0.00675	0.00683
	B	0.00666	0.00671	0.00679
	CI	0.00582	0.00598	0.00606

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00217	0.00206	0.00206
	B	0.00263	0.00259	0.00259
	CI	0.00265	0.00270	0.00277
sky130_osu_sc_15T_ms__addf_l	A	0.00173	0.00157	0.00156
	B	0.00218	0.00210	0.00210
	CI	0.00221	0.00221	0.00229

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00721	0.00723	0.00756
	B	0.00709	0.00720	0.00752
	CI	0.00626	0.00644	0.00681
sky130_osu_sc_15T_ms__addf_l	A	0.00678	0.00677	0.00689
	B	0.00666	0.00675	0.00690
	CI	0.00583	0.00598	0.00617

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01468	0.01477	0.01479
	B	0.01336	0.01310	0.01370
	CI	0.01201	0.01205	0.01208
sky130_osu_sc_15T_ms__addf_l	A	0.01406	0.01406	0.01404
	B	0.01275	0.01240	0.01305
	CI	0.01141	0.01139	0.01140

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00717	0.00790	1.10417	0.51956	1.13432
sky130_osu_sc_15T_ms__addh_l	0.00717	0.00790	0.69637	0.53113	0.71652

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.11365	0.13008
sky130_osu_sc_15T_ms__addh_l	0.00000	0.06827	0.09380

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)	0.16949	0.99688	8.69967
	B->CO (RR)	0.17477	0.99867	8.88937
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.17637	1.09616	8.66773
	B->CO (RR)	0.18168	1.09817	8.86193

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)	0.14406	0.88065	7.40147
	B->CO (FF)	0.15139	0.89422	7.47200
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.13567	0.81869	6.03587
	B->CO (FF)	0.14276	0.83273	6.11130

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	0.22586	0.84579	5.09514
	A->CON (FR)	!B	0.15183	1.21042	11.91330
	B->CON (RR)	A	0.23078	0.84688	5.26870
	B->CON (FR)	!A	0.18241	1.27067	12.18200
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.20808	0.82651	5.07029
	A->CON (FR)	!B	0.13884	1.20680	12.05660
	B->CON (RR)	A	0.21307	0.82781	5.25575
	B->CON (FR)	!A	0.16939	1.26704	12.32670

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	0.21822	0.97892	6.63170
	A->CON (RF)	!B	0.08670	0.82308	8.58562
	B->CON (FF)	A	0.21743	1.00400	6.88065
	B->CON (RF)	!A	0.10376	0.82484	8.42371
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.20296	0.96044	6.60248
	A->CON (RF)	!B	0.08088	0.82236	8.66620
	B->CON (FF)	A	0.20207	0.98656	6.85826
	B->CON (RF)	!A	0.09805	0.82411	8.50080

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	0.17607	2.23418	27.73530
	A->S (FR)	B	0.30820	2.37247	25.57970
	B->S (RR)	!A	0.19323	2.19924	26.96910
	B->S (FR)	A	0.30826	2.43925	26.42680
	CON->S (FR)	-	0.04435	0.96896	12.41650
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.17948	2.06917	22.10060
	A->S (FR)	B	0.30258	2.19215	19.89250
	B->S (RR)	!A	0.19701	2.04516	21.60300
	B->S (FR)	A	0.30215	2.24620	20.48020
	CON->S (FR)	-	0.05475	1.09219	12.56550

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	0.24928	2.90738	35.87790
	A->S (RF)	B	0.29664	1.92381	19.78440
	B->S (FF)	!A	0.27985	2.97070	36.20270
	B->S (RF)	A	0.30165	1.92551	19.97700
	CON->S (RF)	-	0.03198	0.74978	9.64613
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.23352	2.42874	25.63350
	A->S (RF)	B	0.27759	1.66364	14.13300
	B->S (FF)	!A	0.26415	2.49208	25.93060
	B->S (RF)	A	0.28269	1.66475	14.32270
	CON->S (RF)	-	0.03413	0.74609	8.80299

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	0.00324	0.00309	0.00297
	B	0.00000	0.00000	0.00000
	B	0.00299	0.00285	0.00268
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00282	0.00263	0.00267
	B	0.00000	0.00000	0.00000
	B	0.00256	0.00239	0.00238

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	0.00498	0.00479	0.00480
	B	0.00000	0.00000	0.00000
	B	0.00514	0.00513	0.00515
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00455	0.00436	0.00440
	B	0.00000	0.00000	0.00000
	B	0.00472	0.00468	0.00474

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	0.00324	0.00308	0.00314
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00434	0.00436	0.00435
	B	A	0.00000	0.00000	0.00000
	B	A	0.00298	0.00285	0.00290
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00478	0.00477	0.00476
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00281	0.00262	0.00272
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00405	0.00405	0.00406
	B	A	0.00000	0.00000	0.00000
	B	A	0.00255	0.00238	0.00241
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00449	0.00446	0.00444

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	0.00497	0.00481	0.00488
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00076	0.00075	0.00071
	B	A	0.00000	0.00000	0.00000
	B	A	0.00514	0.00513	0.00528
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00129	0.00123	0.00119
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00456	0.00436	0.00449
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00037	0.00035	0.00031
	B	A	0.00000	0.00000	0.00000
	B	A	0.00472	0.00468	0.00481
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00090	0.00084	0.00078

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	0.00498	0.00480	0.00490
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00077	0.00078	0.00077
	B	A	0.00000	0.00000	0.00000
	B	A	0.00515	0.00513	0.00527
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00131	0.00126	0.00124
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00456	0.00437	0.00447
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00037	0.00036	0.00034
	B	A	0.00000	0.00000	0.00000
	B	A	0.00473	0.00469	0.00486
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00091	0.00084	0.00081

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	0.00325	0.00309	0.00303
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00435	0.00438	0.00441
	B	A	0.00000	0.00000	0.00000
	B	A	0.00299	0.00285	0.00266
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00479	0.00481	0.00480
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00281	0.00262	0.00267
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00405	0.00405	0.00408
	B	A	0.00000	0.00000	0.00000
	B	A	0.00256	0.00239	0.00231
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00449	0.00448	0.00447

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00383	0.00393	1.11504
sky130_osu_sc_15T_ms__and2_2	0.00383	0.00393	2.19116
sky130_osu_sc_15T_ms__and2_4	0.00383	0.00393	4.28173
sky130_osu_sc_15T_ms__and2_6	0.00387	0.00393	6.32087
sky130_osu_sc_15T_ms__and2_8	0.00384	0.00394	8.23884
sky130_osu_sc_15T_ms__and2_l	0.00293	0.00303	0.68457

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.05418	0.08665
sky130_osu_sc_15T_ms__and2_2	0.00000	0.08666	0.08678
sky130_osu_sc_15T_ms__and2_4	0.00000	0.15162	0.17318
sky130_osu_sc_15T_ms__and2_6	0.00000	0.21657	0.25970
sky130_osu_sc_15T_ms__and2_8	0.00000	0.28153	0.34623
sky130_osu_sc_15T_ms__and2_l	0.00000	0.00881	0.01404

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)	0.12797	0.91487	8.32347
	B->Y (RR)	0.13578	0.92844	8.54057
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.14908	0.85411	8.59021
	B->Y (RR)	0.15681	0.85882	8.78214
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.20802	0.87864	9.18788
	B->Y (RR)	0.21555	0.87485	9.35149
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.26621	0.92748	9.57569
	B->Y (RR)	0.27342	0.92171	9.70793
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.32251	0.98434	9.87201
	B->Y (RR)	0.33016	0.97889	10.00400
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.14328	1.03221	8.25998
	B->Y (RR)	0.15124	1.04538	8.47385

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)	0.10915	0.79579	6.84098
	B->Y (FF)	0.11515	0.81618	6.98169
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.12856	0.77201	7.15600
	B->Y (FF)	0.13505	0.78827	7.26695
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.18276	0.81206	7.72307
	B->Y (FF)	0.18874	0.82302	7.79423
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.23921	0.86566	8.10180
	B->Y (FF)	0.24431	0.87330	8.15709
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.29220	0.91829	8.32769
	B->Y (FF)	0.29730	0.92479	8.38059
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.12572	0.83613	6.31833
	B->Y (FF)	0.13512	0.85708	6.44210

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	0.00252	0.00221	0.00269
	B	0.00000	0.00000	0.00000
	B	0.00257	0.00225	0.00240
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00478	0.00468	0.00511
	B	0.00000	0.00000	0.00000
	B	0.00483	0.00474	0.00506
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00980	0.01004	0.01088
	B	0.00000	0.00000	0.00000
	B	0.00982	0.01015	0.01073
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01481	0.01529	0.01628
	B	0.00000	0.00000	0.00000
	B	0.01481	0.01539	0.01600
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01975	0.02065	0.02134
	B	0.00000	0.00000	0.00000
	B	0.01987	0.02079	0.02147
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00182	0.00159	0.00198
	B	0.00000	0.00000	0.00000
	B	0.00188	0.00161	0.00175

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	0.00609	0.00597	0.00674
	B	0.00000	0.00000	0.00000
	B	0.00684	0.00671	0.00742
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00764	0.00785	0.00860
	B	0.00000	0.00000	0.00000
	B	0.00841	0.00858	0.00925
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01145	0.01236	0.01321
	B	0.00000	0.00000	0.00000
	B	0.01223	0.01305	0.01378
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01533	0.01689	0.01796
	B	0.00000	0.00000	0.00000
	B	0.01610	0.01751	0.01843
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01910	0.02125	0.02256
	B	0.00000	0.00000	0.00000
	B	0.01984	0.02180	0.02293
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00464	0.00452	0.00503
	B	0.00000	0.00000	0.00000
	B	0.00519	0.00504	0.00549

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)	-0.00213	-0.00215	-0.00216
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00213	-0.00215	-0.00216
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00213	-0.00215	-0.00216
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00215	-0.00216	-0.00217
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00213	-0.00214	-0.00215
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00151	-0.00152	-0.00153

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)	0.00216	0.00217	0.00216
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00216	0.00217	0.00216
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00216	0.00217	0.00217
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00218	0.00219	0.00218
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00216	0.00218	0.00217
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00153	0.00154	0.00153

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)	-0.00202	-0.00203	-0.00202
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00202	-0.00203	-0.00202
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00202	-0.00203	-0.00202
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00202	-0.00203	-0.00202
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00202	-0.00203	-0.00202
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00144	-0.00145	-0.00144

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)	0.00203	0.00204	0.00203
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00203	0.00204	0.00203
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00203	0.00204	0.00203
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00203	0.00204	0.00203
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00203	0.00204	0.00203
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00145	0.00145	0.00145

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00359	0.00378	0.00366	0.49225

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.02156	0.04326

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)	0.14093	1.26734	12.29470
	A1->Y (FR)	0.12004	1.20852	11.96240
	B0->Y (FR)	0.10545	1.20185	12.07610

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)	0.07613	0.77770	8.00679
	A1->Y (RF)	0.06921	0.77943	8.20371
	B0->Y (RF)	0.04211	0.68772	7.60067

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	0.00508	0.00504	0.00504
	A1	0.00000	0.00000	0.00000
	A1	0.00428	0.00423	0.00422
	B0	0.00412	0.00403	0.00411

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	0.00115	0.00098	0.00091
	A1	0.00000	0.00000	0.00000
	A1	0.00115	0.00098	0.00092
	B0	-0.00040	-0.00042	-0.00044

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)	-0.00167	-0.00183	-0.00183
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00186	-0.00187	-0.00186
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00186	-0.00187	-0.00186

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)	0.00182	0.00183	0.00183
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00186	0.00188	0.00187
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00187	0.00190	0.00187

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)	-0.00165	-0.00179	-0.00180
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00183	-0.00184	-0.00183
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00199	-0.00201	-0.00201

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)	0.00179	0.00179	0.00180
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00183	0.00184	0.00184
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00201	0.00203	0.00202

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)	-0.00100	-0.00100	-0.00100

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)	0.00112	0.00112	0.00103

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00359	0.00375	0.00389	0.00369	0.49939

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.02404	0.08652

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)	0.17359	1.29928	12.31520
	A1->Y (FR)	0.15580	1.27015	12.21660
	B0->Y (FR)	0.10838	1.18830	11.96460
	B1->Y (FR)	0.12624	1.21959	12.09240

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)	0.09781	0.80504	8.08459
	A1->Y (RF)	0.09085	0.80409	8.27938
	B0->Y (RF)	0.05426	0.76324	8.23582
	B1->Y (RF)	0.06098	0.76103	8.04037

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	0.00626	0.00620	0.00620
	A1	0.00547	0.00539	0.00538
	B0	0.00442	0.00431	0.00433
	B1	0.00517	0.00508	0.00514

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00230	0.00214	0.00204
	A1	0.00230	0.00213	0.00205
	B0	-0.00022	-0.00025	-0.00028
	B1	-0.00021	-0.00024	-0.00027

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)	-0.00169	-0.00183	-0.00183
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00186	-0.00187	-0.00186
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00186	-0.00187	-0.00186
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00186	-0.00187	-0.00186

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)	0.00182	0.00184	0.00183
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00186	0.00188	0.00187
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00187	0.00190	0.00187
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00187	0.00188	0.00187

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)	-0.00167	-0.00180	-0.00179
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00182	-0.00183	-0.00183
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00198	-0.00200	-0.00201
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00198	-0.00200	-0.00201

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)	0.00179	0.00180	0.00179
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00183	0.00186	0.00184
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00200	0.00202	0.00202
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00200	0.00202	0.00202

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)	-0.00100	-0.00101	-0.00100
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00100	-0.00100	-0.00100
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00206	-0.00207	-0.00209
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00206	-0.00208	-0.00209

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)	0.00118	0.00118	0.00105
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00100	0.00100	0.00100
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00208	0.00211	0.00209
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00208	0.00211	0.00209

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)	-0.00101	-0.00101	-0.00101
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00100	-0.00101	-0.00101
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00190	-0.00191	-0.00190
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00190	-0.00191	-0.00190

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)	0.00119	0.00119	0.00105
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00100	0.00101	0.00101
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00191	0.00192	0.00191
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00191	0.00192	0.00191

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00393	1.10156
sky130_osu_sc_15T_ms__buf_2	0.00397	2.17220
sky130_osu_sc_15T_ms__buf_4	0.00396	4.22031
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00397	8.16892
sky130_osu_sc_15T_ms__buf_l	0.00306	0.68643

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.04339	0.04339
sky130_osu_sc_15T_ms__buf_2	0.00000	0.06508	0.08665
sky130_osu_sc_15T_ms__buf_4	0.00000	0.10847	0.17317
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.19525	0.34622
sky130_osu_sc_15T_ms__buf_l	0.00000	0.00711	0.00711

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)	0.09073	0.86879	8.24389
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.10342	0.79300	8.45389
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.14092	0.79049	8.93340
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.21420	0.85314	9.51281
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.10483	0.98081	8.16187

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)	0.10389	0.78293	6.74751
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.12526	0.77672	7.28091
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.17995	0.81791	7.91363
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.28996	0.92437	8.60174
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.12162	0.82766	6.26730

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	0.00240	0.00201	0.00246
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00466	0.00440	0.00475
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00968	0.00981	0.01033
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01964	0.02037	0.02142
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00179	0.00147	0.00184

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	0.00594	0.00578	0.00654
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00752	0.00763	0.00834
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01137	0.01213	0.01291
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01907	0.02093	0.02214
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00457	0.00439	0.00491

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
	-0.00040	-0.00040	-0.00040

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
	0.00040	0.00040	0.00040

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00369	0.00369	0.01106	1.03838	1.04157
sky130_osu_sc_15T_ms__dffr_l	0.00369	0.00369	0.01103	0.67410	0.67911

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.12595	0.21696
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.08968	0.18068

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)	0.58796	2.05980	17.11530
	QN->Q (FR)	0.05083	1.06729	13.39980
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.56765	2.14129	15.96150
	QN->Q (FR)	0.05969	1.15570	13.05590

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)	0.51455	2.12101	19.15660
	QN->Q (RF)	0.03763	0.81255	10.24590
	RN->Q (FF)	0.36266	2.05435	19.86380
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.52848	2.28666	18.22840
	QN->Q (RF)	0.03829	0.79203	9.21803
	RN->Q (FF)	0.37771	2.22083	18.92340

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)	0.44927	1.26530	8.82777
	RN->QN (FR)	0.29689	1.19834	9.53739
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.45550	1.37121	8.90315
	RN->QN (FR)	0.30383	1.30450	9.59986

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)**	0.50442	1.16604	6.39588
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.47291	1.13070	5.70884

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)	-0.11016	-0.14467	-0.77133
	setup	CK (R)	0.46398	0.46786	1.66446
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10836	-0.14529	-0.77027
	setup	CK (R)	0.46553	0.46709	1.68330

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)	-0.20052	-0.55678	-4.87397
	setup	CK (R)	0.24412	0.57763	4.91348
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.20186	-0.55966	-4.87212
	setup	CK (R)	0.24663	0.57763	4.91442

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)	-0.11016	-0.14467	-0.77133
	setup	CK (R)	0.46398	0.46786	1.66446
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10836	-0.14529	-0.77027
	setup	CK (R)	0.46553	0.46709	1.68330

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)	-0.20052	-0.55678	-4.87397
	setup	CK (R)	0.24412	0.57763	4.91348
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.20186	-0.55966	-4.87212
	setup	CK (R)	0.24663	0.57763	4.91442

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)	0.39675	0.40499	1.45931
	removal	CK (R)	-0.07884	-0.09117	-0.18442
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.40102	0.40757	1.46858
	removal	CK (R)	-0.07884	-0.09117	-0.18442

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)	0.39675	0.40499	1.45931
	removal	CK (R)	-0.07884	-0.09117	-0.18442
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.40102	0.40757	1.46858
	removal	CK (R)	-0.07884	-0.09117	-0.18442

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 ()	0.21561	0.53833	13.33370
	min_pulse_width	RN ()	0.21561	0.53833	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.21359	0.53833	13.33370
	min_pulse_width	RN ()	0.21157	0.53833	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 ()	0.27007	0.53833	13.33370
	min_pulse_width	CK ()	0.29024	0.53833	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.24990	0.53833	13.33370
	min_pulse_width	CK ()	0.28419	0.53833	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 ()	0.57029	0.61676	13.33370
	min_pulse_width	CK ()	0.20350	0.53833	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.56997	0.61894	13.33370
	min_pulse_width	CK ()	0.20149	0.53833	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	0.00610	0.00517	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00539	0.00462	0.00123

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	0.00672	0.00594	0.00000
	RN	-0.00082	-0.03724	-0.47311
	RN	0.01527	0.01453	0.00797
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00600	0.00546	0.00268
	RN	-0.00082	-0.02873	-0.30714
	RN	0.01454	0.01403	0.01111

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	0.00672	0.00595	0.00000
	RN	-0.00082	-0.03731	-0.47457
	RN	0.01527	0.01453	0.00788
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00600	0.00546	0.00264
	RN	-0.00082	-0.02886	-0.30942
	RN	0.01454	0.01404	0.01111

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	0.00607	0.00514	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00536	0.00458	0.00115

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	-0.00157	-0.00180	-0.00182
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00710	0.00674	0.00667
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00303	0.00271	0.00273
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00157	-0.00180	-0.00182
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00710	0.00674	0.00667
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00303	0.00271	0.00273

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	0.00180	0.00184	0.00182
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01134	0.01116	0.01110
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00541	0.00528	0.00530
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00180	0.00184	0.00182
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01134	0.01116	0.01110
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00541	0.00528	0.00530

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)	0.00226	0.00187	0.00223
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00654	0.00599	0.00622
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)	0.00226	0.00187	0.00223
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00654	0.00599	0.00622

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)	0.00561	0.00533	0.00605
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01150	0.01108	0.01153
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)	0.00560	0.00533	0.00605
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01150	0.01107	0.01153

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)	-0.00030	-0.00079	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00343	0.00270	0.00272
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00054	-0.00105	-0.00073
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00030	-0.00079	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00343	0.00270	0.00272
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00054	-0.00105	-0.00073

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)	0.00886	0.00860	0.00918
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01819	0.01752	0.01763
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01371	0.01337	0.01369
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01799	0.01740	0.01865
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00963	0.00934	0.00998
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00886	0.00860	0.00917
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01819	0.01752	0.01763
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01371	0.01337	0.01368
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01799	0.01740	0.01865
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00963	0.00934	0.00998

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00365	0.00370	0.00819	0.01138	1.12759	1.13576
sky130_osu_sc_15T_ms__dffsr_l	0.00365	0.00370	0.00818	0.01138	0.67349	0.68110

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.15696	0.21685
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.12069	0.18058

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)	0.55505	2.05435	17.99610
	QN->Q (FR)	0.04517	1.00727	12.91840
	RN->Q (RR)	0.44734	1.96529	18.07020
	SN->Q (FR)	0.41246	2.00573	19.47350
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.55306	2.13015	16.01990
	QN->Q (FR)	0.05977	1.15367	13.03200
	RN->Q (RR)	0.44577	2.04214	16.09680
	SN->Q (FR)	0.41059	2.08265	17.45060

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)	0.60112	2.21624	19.83690
	QN->Q (RF)	0.03716	0.83382	10.70220
	RN->Q (FF)	0.37976	2.07833	20.55870
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.62294	2.38731	18.32250
	QN->Q (RF)	0.03821	0.79107	9.20798
	RN->Q (FF)	0.40312	2.25297	19.04400

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)	0.53551	1.35068	9.01169
	RN->QN (FR)	0.31584	1.21321	9.74464
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.54766	1.47420	9.03659
	RN->QN (FR)	0.32912	1.33809	9.75802

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)	0.48009	1.16265	6.88444
	RN->QN (RF)	0.37254	1.07506	6.96553
	SN->QN (FF)	0.33782	1.11526	8.36222
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.46314	1.12377	5.80948
	RN->QN (RF)	0.35601	1.03712	5.88619
	SN->QN (FF)	0.32119	1.07702	7.23679

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)	-0.11689	-0.15328	-0.86218
	setup	CK (R)	0.42238	0.41826	1.65790
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.11703	-0.15292	-0.86237
	setup	CK (R)	0.42215	0.41830	1.66248

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)	-0.23972	-0.59031	-5.16764
	setup	CK (R)	0.30560	0.60901	5.19692
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.24016	-0.59120	-5.17011
	setup	CK (R)	0.30496	0.60887	5.19619

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)	-0.11689	-0.15328	-0.86218
	setup	CK (R)	0.42238	0.41826	1.65790
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.11703	-0.15292	-0.86237
	setup	CK (R)	0.42215	0.41830	1.66248

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)	-0.23972	-0.59031	-5.16764
	setup	CK (R)	0.30560	0.60901	5.19692
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.24016	-0.59120	-5.17011
	setup	CK (R)	0.30496	0.60887	5.19619

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)	0.32431	0.32576	1.36095
	removal	CK (R)	-0.03900	-0.04527	-0.13102
	hold	SN (R)	-0.33415	-0.61635	-4.30943
	setup	SN (R)	0.36261	0.67312	6.18869
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.32307	0.32666	1.36253
	removal	CK (R)	-0.03900	-0.04527	-0.13102
	hold	SN (R)	-0.32187	-0.59999	-4.18714
	setup	SN (R)	0.36476	0.65652	6.08769

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)	0.32431	0.32576	1.36095
	removal	CK (R)	-0.03900	-0.04527	-0.13102
	hold	SN (R)	-0.33574	-0.61635	-4.30943
	hold	SN (R)	-0.33415	-0.61826	-4.31715
	setup	SN (R)	0.36254	0.67312	6.09674
	setup	SN (R)	0.36261	0.67295	6.18869
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.32307	0.32666	1.36253
	removal	CK (R)	-0.03900	-0.04527	-0.13102
	hold	SN (R)	-0.32418	-0.59999	-4.18714
	hold	SN (R)	-0.32187	-0.60390	-4.19774
	setup	SN (R)	0.36476	0.65231	5.97548
	setup	SN (R)	0.34310	0.65652	6.08769

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 ()	0.24390	0.55794	13.33370
	min_pulse_width	RN ()	0.25018	0.55794	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.24299	0.55576	13.33370
	min_pulse_width	RN ()	0.24299	0.55576	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)	0.06647	0.10627	1.80274
	removal	CK (R)	-0.02336	-0.06839	-0.63867
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.06578	0.10227	1.69657
	removal	CK (R)	-0.02289	-0.06839	-0.64162

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)	0.06647	0.10627	1.80274
	removal	CK (R)	-0.02336	-0.06839	-0.63867
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.06578	0.10227	1.69657
	removal	CK (R)	-0.02289	-0.06839	-0.64162

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 ()	0.32472	0.66251	13.33370
	min_pulse_width	SN ()	0.32723	0.66251	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.32516	0.64290	13.33370
	min_pulse_width	SN ()	0.30919	0.64508	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 ()	0.24990	0.53833	13.33370
	min_pulse_width	CK ()	0.31848	0.53833	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.23981	0.53833	13.33370
	min_pulse_width	CK ()	0.31444	0.53833	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 ()	0.52743	0.57972	13.33370
	min_pulse_width	CK ()	0.27007	0.53833	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.52763	0.57754	13.33370
	min_pulse_width	CK ()	0.26805	0.53833	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	0.00747	0.00650	-0.00136
	RN	0.01362	0.01281	0.00429
	SN	-0.00082	-0.03913	-0.51376
	SN	0.01485	0.01409	0.00566
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00684	0.00609	0.00266
	RN	0.01297	0.01239	0.00855
	SN	-0.00082	-0.02872	-0.30686
	SN	0.01421	0.01367	0.00976

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	0.00781	0.00732	0.00336
	RN	-0.00082	-0.03913	-0.51376
	RN	0.01589	0.01534	0.01135
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00715	0.00666	0.00391
	RN	-0.00082	-0.02872	-0.30686
	RN	0.01521	0.01466	0.01181

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	0.00781	0.00732	0.00327
	RN	-0.00082	-0.03929	-0.51748
	RN	0.01589	0.01534	0.01121
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00715	0.00666	0.00388
	RN	-0.00082	-0.02891	-0.31033
	RN	0.01521	0.01466	0.01179

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	0.00744	0.00647	-0.00160
	RN	0.01358	0.01279	0.00432
	SN	-0.00082	-0.03929	-0.51746
	SN	0.01482	0.01406	0.00561
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00679	0.00605	0.00257
	RN	0.01293	0.01236	0.00851
	SN	-0.00082	-0.02891	-0.31031
	SN	0.01417	0.01363	0.00962

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	-0.00177	-0.00180	-0.00181
	(!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)	0.00905	0.00872	0.00868
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00342	0.00312	0.00312
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00341	0.00311	0.00313
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00345	0.00315	0.00316
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00177	-0.00180	-0.00181
	(!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)	0.00905	0.00872	0.00868
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00342	0.00312	0.00312
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00341	0.00311	0.00313
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00345	0.00315	0.00315

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	0.00181	0.00180	0.00181
	(!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)	0.01309	0.01290	0.01271
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00580	0.00568	0.00572
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00584	0.00570	0.00572
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00577	0.00565	0.00569
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00181	0.00180	0.00181
	(!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)	0.01308	0.01290	0.01270
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00579	0.00567	0.00572
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00583	0.00570	0.00572
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00576	0.00564	0.00568

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)	0.00223	0.00183	0.00208
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00806	0.00749	0.00762
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)	0.00223	0.00183	0.00208
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00806	0.00749	0.00762

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)	0.00609	0.00586	0.00659
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01222	0.01176	0.01220
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)	0.00608	0.00585	0.00658
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01221	0.01175	0.01219

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)	-0.00421	-0.00426	-0.00427
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00428	-0.00452	-0.00453
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00416	-0.00430	-0.00429
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00277	0.00240	0.00243
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)	-0.00421	-0.00426	-0.00427
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00427	-0.00450	-0.00451
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00415	-0.00430	-0.00428
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00277	0.00241	0.00244

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)	0.00427	0.00431	0.00429
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00452	0.00452	0.00453
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00427	0.00434	0.00430
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00933	0.00911	0.00913
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)	0.00427	0.00431	0.00429
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00451	0.00450	0.00452
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00426	0.00434	0.00429
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00932	0.00911	0.00912

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)	-0.00030	-0.00079	-0.00050
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00398	0.00328	0.00330
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00392	0.00321	0.00326
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00043	-0.00092	-0.00061
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00268	0.00177	0.00247
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00030	-0.00079	-0.00050
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00398	0.00327	0.00330
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00391	0.00320	0.00325
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00043	-0.00092	-0.00061
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00268	0.00177	0.00247

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)	0.02027	0.01962	0.01973
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00888	0.00862	0.00921
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01398	0.01363	0.01398
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01402	0.01368	0.01397
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01970	0.01905	0.02018
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00954	0.00925	0.00990
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01173	0.01124	0.01255
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02027	0.01962	0.01973
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00888	0.00862	0.00921
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01398	0.01363	0.01398
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01402	0.01368	0.01397
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01970	0.01904	0.02016
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00954	0.00925	0.00990
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01172	0.01123	0.01255

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00368	0.00658	0.01116	1.04865	1.04565
sky130_osu_sc_15T_ms__dffs_l	0.00368	0.00657	0.01116	0.68529	0.68321

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.11286	0.17332
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.07658	0.13704

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)	0.41621	1.87087	17.05670
	QN->Q (FR)	0.05081	1.06774	13.42370
	SN->Q (FR)	0.32515	1.91083	18.54070
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.41186	1.97714	16.01270
	QN->Q (FR)	0.05970	1.15943	13.14320
	SN->Q (FR)	0.31904	2.01303	17.42690

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)	0.57923	2.19698	19.34660
	QN->Q (RF)	0.03741	0.81323	10.26600
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.58933	2.36621	18.52950
	QN->Q (RF)	0.03813	0.79359	9.26665

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)	0.51033	1.33579	8.89970
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.51366	1.43745	8.98960

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)	0.34338	0.97808	6.23799
	SN->QN (FF)	0.25101	1.01924	7.72179
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.32752	0.96111	5.57670
	SN->QN (FF)	0.23379	0.99799	6.99228

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)	-0.08984	-0.12553	-0.72193
	setup	CK (R)	0.30291	0.31619	1.59375
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.08697	-0.12541	-0.72353
	setup	CK (R)	0.30321	0.31690	1.60555

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)	-0.21330	-0.56497	-4.93641
	setup	CK (R)	0.28279	0.58819	4.98303
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.21192	-0.56512	-4.93506
	setup	CK (R)	0.28237	0.58815	4.98298

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)	-0.08984	-0.12553	-0.72193
	setup	CK (R)	0.30291	0.31619	1.59375
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.08697	-0.12541	-0.72353
	setup	CK (R)	0.30321	0.31690	1.60555

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)	-0.21330	-0.56497	-4.93641
	setup	CK (R)	0.28279	0.58819	4.98303
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.21192	-0.56512	-4.93506
	setup	CK (R)	0.28237	0.58815	4.98298

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)	0.07081	0.09947	1.25885
	removal	CK (R)	-0.02441	-0.05644	-0.34972
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.07110	0.09913	1.16947
	removal	CK (R)	-0.02441	-0.05644	-0.34972

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)	0.07081	0.09947	1.25885
	removal	CK (R)	-0.02441	-0.05644	-0.34972
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.07110	0.09913	1.16947
	removal	CK (R)	-0.02441	-0.05644	-0.34972

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 ()	0.23130	0.64508	13.33370
	min_pulse_width	SN ()	0.23373	0.64508	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.22163	0.62329	13.33370
	min_pulse_width	SN ()	0.22000	0.62547	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 ()	0.17325	0.53833	13.33370
	min_pulse_width	CK ()	0.30637	0.53833	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.16518	0.53833	13.33370
	min_pulse_width	CK ()	0.29830	0.53833	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 ()	0.40924	0.53833	13.33370
	min_pulse_width	CK ()	0.24788	0.53833	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.40924	0.53833	13.33370
	min_pulse_width	CK ()	0.24788	0.53833	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	0.00611	0.00513	0.00000
	SN	-0.00082	-0.03746	-0.47779
	SN	0.01276	0.01190	0.00472
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00539	0.00459	0.00123
	SN	-0.00082	-0.02902	-0.31224
	SN	0.01203	0.01136	0.00773

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	0.00669	0.00595	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00597	0.00547	0.00271

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	0.00668	0.00596	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00597	0.00547	0.00271

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	0.00608	0.00510	0.00000
	SN	-0.00082	-0.03739	-0.47640
	SN	0.01272	0.01187	0.00470
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00535	0.00455	0.00117
	SN	-0.00082	-0.02897	-0.31127
	SN	0.01199	0.01132	0.00761

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	-0.00180	-0.00183	-0.00184
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00692	0.00655	0.00642
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00296	0.00265	0.00265
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00180	-0.00183	-0.00184
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00692	0.00655	0.00642
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00296	0.00265	0.00265

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	0.00184	0.00183	0.00184
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01118	0.01098	0.01090
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00553	0.00540	0.00544
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00184	0.00183	0.00184
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01118	0.01098	0.01090
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00553	0.00540	0.00544

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)	-0.00307	-0.00308	-0.00309
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00235	0.00203	0.00224
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)	-0.00307	-0.00309	-0.00309
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00235	0.00204	0.00224

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)	0.00310	0.00309	0.00311
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00660	0.00630	0.00661
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)	0.00310	0.00309	0.00310
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00660	0.00630	0.00661

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)	-0.00032	-0.00079	-0.00052
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00051	-0.00102	-0.00070
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00220	0.00128	0.00202
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00032	-0.00079	-0.00052
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00051	-0.00102	-0.00070
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00220	0.00128	0.00202

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)	0.01808	0.01743	0.01753
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00887	0.00861	0.00918
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01777	0.01708	0.01833
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00959	0.00930	0.00994
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01140	0.01085	0.01226
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01808	0.01743	0.01753
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00887	0.00861	0.00918
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01777	0.01708	0.01833
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00959	0.00930	0.00994
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01140	0.01085	0.01226

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00384	0.01091	1.13013	1.13282
sky130_osu_sc_15T_ms__dff_l	0.00383	0.01091	0.64013	0.64206

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.14134	0.17361
sky130_osu_sc_15T_ms__dff_l	0.00000	0.10507	0.13733

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)	0.34084	1.80940	17.70210
	QN->Q (FR)	0.04488	1.00387	12.90230
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.35272	1.90103	15.45050
	QN->Q (FR)	0.06583	1.22353	13.61240

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)	0.49558	2.10277	19.71350
	QN->Q (RF)	0.03700	0.83244	10.69380
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.52680	2.30561	18.09620
	QN->Q (RF)	0.03823	0.77810	8.99344

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)	0.43322	1.23554	8.84825
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.45189	1.38806	8.95387

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)	0.27570	0.92098	6.56828
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.26961	0.88500	5.29709

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)	-0.08382	-0.12050	-0.73993
	setup	CK (R)	0.23208	0.24346	1.59738
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.08510	-0.12256	-0.74068
	setup	CK (R)	0.22878	0.24156	1.59858

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)	-0.20108	-0.56985	-5.01951
	setup	CK (R)	0.24465	0.59222	5.06795
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.20393	-0.56812	-5.02038
	setup	CK (R)	0.24419	0.59220	5.06799

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 ()	0.14703	0.53833	13.33370
	min_pulse_width	CK ()	0.28822	0.53833	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.14299	0.53833	13.33370
	min_pulse_width	CK ()	0.28015	0.53833	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 ()**	0.33461	0.53833	13.33370
	min_pulse_width	**CK ()**	0.19947	0.53833	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.33259	0.53833	13.33370
	min_pulse_width	**CK ()**	0.19947	0.53833	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	0.00646	0.00537	-0.00234
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00583	0.00499	0.00176

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	0.00682	0.00632	0.00234
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00616	0.00549	0.00135

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	0.00682	0.00632	0.00239
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00616	0.00550	0.00135

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	0.00643	0.00534	-0.00239
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00579	0.00495	0.00163

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	-0.00157	-0.00179	-0.00181
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00656	0.00621	0.00610
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00157	-0.00179	-0.00181
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00657	0.00621	0.00611

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	0.00180	0.00180	0.00181
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01163	0.01137	0.01132
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00180	0.00180	0.00181
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01163	0.01137	0.01132

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)	-0.00032	-0.00079	-0.00051
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00050	-0.00100	-0.00068
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00032	-0.00079	-0.00051
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00050	-0.00100	-0.00068

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)	0.00882	0.00855	0.00914
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.01771	0.01708	0.01720
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.01807	0.01731	0.01858
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00953	0.00924	0.00989
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00882	0.00855	0.00914
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.01772	0.01709	0.01720
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.01808	0.01731	0.01858
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00953	0.00924	0.00989

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00375	1.08527
sky130_osu_sc_15T_ms__inv_10	0.03441	10.21975
sky130_osu_sc_15T_ms__inv_2	0.00707	2.15603
sky130_osu_sc_15T_ms__inv_3	0.01052	3.11300
sky130_osu_sc_15T_ms__inv_4	0.01388	4.22283
sky130_osu_sc_15T_ms__inv_6	0.02079	6.24513
sky130_osu_sc_15T_ms__inv_8	0.02760	8.23052
sky130_osu_sc_15T_ms__inv_l	0.00282	0.62608

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.02170	0.04326
sky130_osu_sc_15T_ms__inv_10	0.00000	0.21694	0.43262
sky130_osu_sc_15T_ms__inv_2	0.00000	0.04339	0.08652
sky130_osu_sc_15T_ms__inv_3	0.00000	0.06508	0.12979
sky130_osu_sc_15T_ms__inv_4	0.00000	0.08678	0.17305
sky130_osu_sc_15T_ms__inv_6	0.00000	0.13017	0.25957
sky130_osu_sc_15T_ms__inv_8	0.00000	0.17356	0.34609
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00356	0.00693

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)**	0.04336	0.95197	12.09730
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.05371	0.66047	12.14630
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.03370	0.82055	12.04070
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.03623	0.76664	12.03060
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.03608	0.73314	12.07770
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.04000	0.69199	12.07530
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.04628	0.67140	12.06460
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.05865	1.08841	12.16090

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)**	0.03333	0.75428	9.60008
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.04436	0.54303	9.67482
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02689	0.66575	9.59840
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02899	0.63319	9.66860
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02847	0.60720	9.69557
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.03335	0.57606	9.70473
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03865	0.55553	9.68968
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.03530	0.72505	8.35577

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	0.00306	0.00304	0.00319
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02588	0.02639	0.02815
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00540	0.00541	0.00577
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00829	0.00768	0.00884
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01061	0.01071	0.01142
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01574	0.01593	0.01708
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02084	0.02113	0.02265
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00229	0.00225	0.00233

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	-0.00051	-0.00055	-0.00053
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00972	-0.00931	-0.00793
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00176	-0.00176	-0.00165
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00230	-0.00232	-0.00211
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00363	-0.00356	-0.00324
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00553	-0.00547	-0.00482
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00756	-0.00737	-0.00639
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00032	-0.00035	-0.00035

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.06605	0.06589	0.00767	0.06028

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.04345	0.04345

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)	-	0.02627	0.41092	3.73759
	A1->Y (RR)	-	0.02967	0.41421	3.75181
	S0->Y (RR)	(!A0 * A1)	0.07974	0.41776	1.76740
	S0->Y (FR)	(A0 * !A1)	0.05188	0.49621	3.48016

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)	-	0.02656	0.36392	3.16678
	A1->Y (FF)	-	0.02371	0.36018	3.16042
	S0->Y (FF)	(!A0 * A1)	0.10301	0.49442	2.48999
	S0->Y (RF)	(A0 * !A1)	0.03707	0.39580	2.65084

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	-	-0.00314	-0.00315	-0.00315
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00216	-0.00217	-0.00217
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00388	0.00369	0.00448
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00199	-0.00242	-0.00196

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	-	0.00314	0.00315	0.00315
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00216	0.00217	0.00217
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00069	0.00028	0.00078
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00817	0.00794	0.00866

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)	-0.00081	-0.00081	-0.00081

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)	0.00081	0.00081	0.00081

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)	-0.00096	-0.00096	-0.00096

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)	0.00096	0.00096	0.00096

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00066	-0.00110	-0.00060
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00064	-0.00109	-0.00060

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)	0.00623	0.00603	0.00674
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00582	0.00564	0.00640

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00375	0.00371	1.00049
sky130_osu_sc_15T_ms__nand2_l	0.00282	0.00281	0.62264

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.02171	0.08652
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00357	0.01386

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)	0.04514	0.93048	11.62090
	B->Y (FR)	0.05232	0.92984	11.48880
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.06030	1.09456	12.15530
	B->Y (FR)	0.07068	1.10346	12.13990

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)	0.05259	0.97060	11.99760
	B->Y (RF)	0.05971	0.97090	11.86250
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.05586	0.95910	10.59630
	B->Y (RF)	0.06223	0.95706	10.41490

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	0.00324	0.00322	0.00336
	B	0.00000	0.00000	0.00000
	B	0.00403	0.00397	0.00407
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00240	0.00236	0.00243
	B	0.00000	0.00000	0.00000
	B	0.00296	0.00291	0.00298

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	-0.00031	-0.00037	-0.00035
	B	0.00000	0.00000	0.00000
	B	-0.00028	-0.00034	-0.00034
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00021	-0.00025	-0.00025
	B	0.00000	0.00000	0.00000
	B	-0.00019	-0.00023	-0.00024

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)	-0.00209	-0.00210	-0.00211
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00145	-0.00146	-0.00146

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)	0.00211	0.00213	0.00212
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00147	0.00147	0.00147

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)	-0.00193	-0.00194	-0.00193
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00134	-0.00135	-0.00135

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)	0.00194	0.00195	0.00194
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00135	0.00136	0.00135

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00372	0.00401	0.51881
sky130_osu_sc_15T_ms__nor2_l	0.00272	0.00304	0.32319

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.01643	0.04326
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00287	0.00693

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)	0.10428	1.19777	12.15970
	B->Y (FR)	0.08402	1.14672	11.88980
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.12894	1.36045	12.12780
	B->Y (FR)	0.11122	1.32111	12.01100

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)	0.04295	0.63782	7.07584
	B->Y (RF)	0.03529	0.62770	7.05749
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.04261	0.62435	6.40735
	B->Y (RF)	0.03708	0.61606	6.39144

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	0.00417	0.00413	0.00413
	B	0.00000	0.00000	0.00000
	B	0.00336	0.00328	0.00333
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00297	0.00293	0.00292
	B	0.00000	0.00000	0.00000
	B	0.00248	0.00240	0.00245

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	0.00050	0.00036	0.00032
	B	0.00000	0.00000	0.00000
	B	-0.00041	-0.00045	-0.00047
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00031	0.00021	0.00020
	B	0.00000	0.00000	0.00000
	B	-0.00023	-0.00026	-0.00029

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)	-0.00158	-0.00181	-0.00182
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00108	-0.00121	-0.00121

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)	0.00182	0.00183	0.00182
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00120	0.00122	0.00121

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)	-0.00101	-0.00101	-0.00100
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00066	-0.00066	-0.00065

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)	0.00107	0.00107	0.00103
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00069	0.00070	0.00067

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00374	0.00381	0.00321	0.51813

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.01086	0.05019

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)	0.11501	1.19445	12.07020
	A1->Y (FR)	0.14081	1.25295	12.35010
	B0->Y (FR)	0.07165	0.99984	10.68830

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)	0.07146	0.81192	8.45816
	A1->Y (RF)	0.08328	0.80493	8.29949
	B0->Y (RF)	0.05705	0.81469	8.77022

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	0.00446	0.00437	0.00442
	A1	0.00000	0.00000	0.00000
	A1	0.00532	0.00525	0.00524
	B0	0.00358	0.00345	0.00349

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	0.00016	0.00012
	A1	0.00000	0.00000	0.00000
	A1	0.00114	0.00100	0.00095
	B0	0.00156	0.00148	0.00145

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)	-0.00100	-0.00101	-0.00101
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00181	-0.00183	-0.00183
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00187	-0.00189	-0.00188

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)	0.00108	0.00108	0.00103
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00182	0.00183	0.00183
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00187	0.00189	0.00188

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)	-0.00154	-0.00177	-0.00178
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00178	-0.00182	-0.00181
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00184	-0.00185	-0.00185

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)	0.00177	0.00177	0.00178
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00181	0.00182	0.00181
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00185	0.00187	0.00186

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)	-0.00148	-0.00150	-0.00153

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)	0.00153	0.00154	0.00153

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00360	0.00384	0.00396	0.00387	0.52242

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.02465	0.08652

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)	0.15308	1.25547	12.27480
	A1->Y (FR)	0.13138	1.20221	12.00690
	B0->Y (FR)	0.09216	1.16052	11.96990
	B1->Y (FR)	0.11566	1.21443	12.24000

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)	0.11271	0.86784	8.57917
	A1->Y (RF)	0.09300	0.84086	8.51726
	B0->Y (RF)	0.07846	0.84193	8.83030
	B1->Y (RF)	0.09909	0.87082	8.91335

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	0.00682	0.00676	0.00675
	A1	0.00594	0.00583	0.00588
	B0	0.00440	0.00432	0.00435
	B1	0.00531	0.00526	0.00525

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00178	0.00165	0.00158
	A1	0.00092	0.00086	0.00078
	B0	0.00091	0.00085	0.00078
	B1	0.00180	0.00164	0.00158

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)	-0.00157	-0.00181	-0.00182
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00157	-0.00181	-0.00182
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00178	-0.00182	-0.00182
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00185	-0.00187	-0.00186

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)	0.00182	0.00183	0.00182
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00182	0.00183	0.00182
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00181	0.00182	0.00182
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00185	0.00187	0.00186

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)	-0.00100	-0.00100	-0.00100
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00100	-0.00100	-0.00100
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00177	-0.00180	-0.00180
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00184	-0.00185	-0.00184

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)	0.00106	0.00107	0.00102
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00106	0.00107	0.00102
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00179	0.00180	0.00180
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00184	0.00185	0.00185

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)	-0.00099	-0.00099	-0.00099
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00099	-0.00099	-0.00099
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00200	-0.00204	-0.00203
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00200	-0.00201	-0.00207

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)	0.00105	0.00106	0.00101
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00105	0.00106	0.00101
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00203	0.00204	0.00203
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00207	0.00209	0.00208

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)	-0.00154	-0.00177	-0.00179
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00154	-0.00177	-0.00179
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00204	-0.00210	-0.00208
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00205	-0.00207	-0.00211

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)	0.00178	0.00178	0.00179
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00178	0.00179	0.00179
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00208	0.00210	0.00208
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00212	0.00213	0.00212

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00408	0.00384	1.10145
sky130_osu_sc_15T_ms__or2_2	0.00408	0.00384	2.19906
sky130_osu_sc_15T_ms__or2_4	0.00408	0.00384	4.24932
sky130_osu_sc_15T_ms__or2_8	0.00407	0.00384	8.08812
sky130_osu_sc_15T_ms__or2_l	0.00313	0.00288	0.63263

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.02734	0.04352
sky130_osu_sc_15T_ms__or2_2	0.00000	0.03825	0.08678
sky130_osu_sc_15T_ms__or2_4	0.00000	0.06007	0.17330
sky130_osu_sc_15T_ms__or2_8	0.00000	0.10371	0.34635
sky130_osu_sc_15T_ms__or2_l	0.00000	0.00474	0.00730

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)	0.10692	0.91116	8.48590
	B->Y (RR)	0.09597	0.87815	8.28110
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.11781	0.82929	8.73994
	B->Y (RR)	0.10635	0.80309	8.56937
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.15559	0.81912	9.14294
	B->Y (RR)	0.14383	0.79897	9.03288
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.22874	0.87298	9.65025
	B->Y (RR)	0.21677	0.85789	9.54152
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.11950	1.03196	8.28451
	B->Y (RR)	0.10949	1.00123	8.10549

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)	0.20912	0.95217	7.68243
	B->Y (FF)	0.18049	0.89324	7.12721
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.25637	0.94844	8.09570
	B->Y (FF)	0.22753	0.89875	7.59199
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.36881	1.04597	8.71178
	B->Y (FF)	0.34027	0.99205	8.26372
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.59349	1.28252	9.38107
	B->Y (FF)	0.56437	1.22609	9.02487
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.24669	0.96632	6.61995
	B->Y (FF)	0.21350	0.91683	6.17058

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	0.00341	0.00299	0.00320
	B	0.00000	0.00000	0.00000
	B	0.00253	0.00218	0.00261
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00570	0.00546	0.00560
	B	0.00000	0.00000	0.00000
	B	0.00478	0.00468	0.00507
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01073	0.01088	0.01145
	B	0.00000	0.00000	0.00000
	B	0.00979	0.01016	0.01085
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02071	0.02156	0.02222
	B	0.00000	0.00000	0.00000
	B	0.01977	0.02082	0.02209
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00246	0.00216	0.00235
	B	0.00000	0.00000	0.00000
	B	0.00189	0.00164	0.00199

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	0.00705	0.00697	0.00701
	B	0.00000	0.00000	0.00000
	B	0.00602	0.00599	0.00674
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00857	0.00887	0.00889
	B	0.00000	0.00000	0.00000
	B	0.00754	0.00783	0.00856
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01237	0.01333	0.01354
	B	0.00000	0.00000	0.00000
	B	0.01136	0.01225	0.01306
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01998	0.02194	0.02281
	B	0.00000	0.00000	0.00000
	B	0.01912	0.02081	0.02220
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00527	0.00510	0.00514
	B	0.00000	0.00000	0.00000
	B	0.00453	0.00446	0.00493

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)	-0.00159	-0.00182	-0.00184
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00159	-0.00182	-0.00184
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00159	-0.00183	-0.00184
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00159	-0.00183	-0.00184
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00109	-0.00123	-0.00123

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)	0.00183	0.00184	0.00184
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00183	0.00184	0.00184
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00183	0.00184	0.00184
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00183	0.00184	0.00184
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00122	0.00123	0.00123

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)	-0.00100	-0.00101	-0.00101
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00100	-0.00101	-0.00101
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00100	-0.00101	-0.00101
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00100	-0.00101	-0.00101
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00067	-0.00068	-0.00067

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)	0.00108	0.00108	0.00103
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00108	0.00109	0.00103
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00108	0.00109	0.00103
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00108	0.00109	0.00103
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00071	0.00072	0.00068

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00399	0.00514	0.52192
sky130_osu_sc_15T_ms__tbufi_l	0.00304	0.00396	0.32907

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.02179	0.08653
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00369	0.01386

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)	0.07886	1.14092	11.88510
	OE->Y (FR)	0.06526	0.37636	4.01327
	OE->Y (RR)	0.13435	1.08922	8.37118
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.10621	1.32759	12.14410
	OE->Y (FR)	0.07742	0.40665	4.01310
	OE->Y (RR)	0.15529	1.25359	8.35509

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)	0.05098	0.77924	8.48816
	OE->Y (FF)	0.06627	0.37835	4.01328
	OE->Y (RF)	0.05038	0.77071	8.30273
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.05519	0.77303	7.73054
	OE->Y (FF)	0.07895	0.40862	4.01309
	OE->Y (RF)	0.05316	0.75977	7.49008

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	0.00311	0.00304	0.00308
	OE	0.00000	0.00000	0.00000
	OE	0.00299	0.00258	0.00320
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00231	0.00223	0.00227
	OE	0.00000	0.00000	0.00000
	OE	0.00212	0.00180	0.00229

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	-0.00042	-0.00045	-0.00048
	OE	0.00000	0.00000	0.00000
	OE	0.00207	0.00165	0.00222
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00023	-0.00026	-0.00029
	OE	0.00000	0.00000	0.00000
	OE	0.00140	0.00109	0.00152

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)	-0.00158	-0.00160	-0.00159
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00144	-0.00145	-0.00145
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00113	-0.00114	-0.00114
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00104	-0.00104	-0.00104

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)	0.00158	0.00160	0.00159
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00150	0.00151	0.00147
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00113	0.00114	0.00114
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00107	0.00108	0.00105

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)	0.00120	0.00080	0.00136
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00107	0.00066	0.00121
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00079	0.00049	0.00091
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00070	0.00039	0.00082

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)	0.00368	0.00332	0.00408
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00371	0.00339	0.00415
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00282	0.00256	0.00307
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00287	0.00262	0.00312

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00398	0.00606	0.52193
sky130_osu_sc_15T_ms__tnbufi_l	0.00304	0.00439	0.32322

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.03617	0.04340
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.00594	0.00711

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)	0.07988	1.14095	11.88530
	OE->Y (RR)	0.03916	0.30945	4.01381
	OE->Y (FR)	0.09533	1.18657	12.14880
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.10709	1.31773	12.01490
	OE->Y (RR)	0.03915	0.30925	4.01377
	OE->Y (FR)	0.11926	1.35192	12.13180

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)	0.05002	0.77885	8.48758
	OE->Y (RF)	0.03897	0.30938	4.01383
	OE->Y (FF)	0.09395	0.77542	5.68269
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.05397	0.76825	7.66878
	OE->Y (RF)	0.03857	0.30923	4.01376
	OE->Y (FF)	0.10838	0.80008	5.16917

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	0.00321	0.00313	0.00317
	OE	0.00000	0.00000	0.00000
	OE	0.00757	0.00742	0.00841
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00241	0.00233	0.00236
	OE	0.00000	0.00000	0.00000
	OE	0.00549	0.00535	0.00601

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	-0.00054	-0.00057	-0.00059
	OE	0.00000	0.00000	0.00000
	OE	0.00679	0.00665	0.00751
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00035	-0.00038	-0.00040
	OE	0.00000	0.00000	0.00000
	OE	0.00486	0.00473	0.00535

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)	-0.00135	-0.00136	-0.00135
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00122	-0.00123	-0.00122
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00091	-0.00092	-0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00082	-0.00083	-0.00082

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)	0.00135	0.00136	0.00135
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00126	0.00127	0.00125
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00091	0.00092	0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00085	0.00085	0.00083

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)	-0.00205	-0.00265	-0.00208
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00205	-0.00263	-0.00206
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00131	-0.00174	-0.00130
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00130	-0.00172	-0.00129

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)	0.00577	0.00565	0.00655
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00568	0.00554	0.00644
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00415	0.00403	0.00464
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00409	0.00395	0.00457

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00790	0.00697	0.53790

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.07558	0.12992

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	0.17118	1.15391	8.74342
	A->Y (FR)	!B	0.10447	1.18047	12.08850
	B->Y (RR)	A	0.13929	1.11648	8.64493
	B->Y (FR)	!A	0.13093	1.23235	12.35390

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	0.15335	0.88354	6.21652
	A->Y (RF)	!B	0.07102	0.79409	8.42814
	B->Y (FF)	A	0.13675	0.86455	6.18382
	B->Y (RF)	!A	0.08400	0.81179	8.44560

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	0.00299	0.00253	0.00298
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00774	0.00741	0.00825
	B	A	0.00000	0.00000	0.00000
	B	A	0.00137	0.00104	0.00155
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00819	0.00794	0.00880

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	0.00945	0.00902	0.00969
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00214	0.00166	0.00214
	B	A	0.00000	0.00000	0.00000
	B	A	0.00842	0.00831	0.00912
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00293	0.00240	0.00286

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.00794	0.00703	0.51611

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.07558	0.12823

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	0.17007	1.13379	8.46928
	A->Y (FR)	B	0.12395	1.21113	12.14540
	B->Y (RR)	!A	0.14509	1.11492	8.46214
	B->Y (FR)	A	0.13419	1.22521	12.15480

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	0.14549	0.86814	6.08591
	A->Y (RF)	B	0.07059	0.80433	8.47309
	B->Y (FF)	!A	0.13527	0.85562	6.04818
	B->Y (RF)	A	0.08159	0.80303	8.28923

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	0.00889	0.00861	0.00947
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00182	0.00112	0.00152
	B	A	0.00000	0.00000	0.00000
	B	A	0.00904	0.00878	0.00967
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00128	0.00090	0.00142

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	0.00200	0.00140	0.00184
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00961	0.00940	0.01015
	B	A	0.00000	0.00000	0.00000
	B	A	0.00202	0.00148	0.00193
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00858	0.00846	0.00928

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
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	0.24626
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	84186.80000	168374.00000
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
	-0.00155	0.01676	0.22884

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
	1.46562	1.37954	0.29515