sky130_osu_sc_18T_ms_tt_1P89_25C.ccs Library

Cell Groups
SKY130_OSU_SC_18T_MS__ADDFx
SKY130_OSU_SC_18T_MS__ADDHx
SKY130_OSU_SC_18T_MS__AND2x
SKY130_OSU_SC_18T_MS__AOI21
SKY130_OSU_SC_18T_MS__AOI22
SKY130_OSU_SC_18T_MS__BUFx
SKY130_OSU_SC_18T_MS__DFFRx
SKY130_OSU_SC_18T_MS__DFFSRx
SKY130_OSU_SC_18T_MS__DFFSx
SKY130_OSU_SC_18T_MS__DFFx
SKY130_OSU_SC_18T_MS__INVx
SKY130_OSU_SC_18T_MS__MUX2
SKY130_OSU_SC_18T_MS__NAND2x
SKY130_OSU_SC_18T_MS__NOR2x
SKY130_OSU_SC_18T_MS__OAI21
SKY130_OSU_SC_18T_MS__OAI22
SKY130_OSU_SC_18T_MS__OR2x
SKY130_OSU_SC_18T_MS__TBUFIx
SKY130_OSU_SC_18T_MS__TNBUFIx
SKY130_OSU_SC_18T_MS__XNOR2
SKY130_OSU_SC_18T_MS__XOR2
SKY130_OSU_SC_18T_MS_x

SKY130_OSU_SC_18T_MS__ADDFx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__addf_1	46.88640
sky130_osu_sc_18T_ms__addf_l	46.88640

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_18T_ms__addf_1	0.02142	0.02136	0.01631	3.26113	1.54386	3.14925
sky130_osu_sc_18T_ms__addf_l	0.02141	0.02135	0.01630	2.21540	1.54294	2.21198

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.80024	1.08941
sky130_osu_sc_18T_ms__addf_l	0.00000	0.65748	0.94665

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.13052	1.63623	26.61530
	B->CO (RR)	0.11113	1.54991	25.31000
	CI->CO (RR)	0.12425	1.67481	27.24180
	CON->CO (FR)	0.02407	0.67397	10.66580
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.13197	1.52166	21.44910
	B->CO (RR)	0.11287	1.44930	20.55710
	CI->CO (RR)	0.12568	1.56153	22.10700
	CON->CO (FR)	0.02720	0.73765	10.69730

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.16361	1.95265	31.63570
	B->CO (FF)	0.14431	1.86544	30.38590
	CI->CO (FF)	0.14206	1.94697	31.85720
	CON->CO (RF)	0.02302	0.63292	10.13070
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.16081	1.75421	24.57610
	B->CO (FF)	0.14173	1.68151	23.77670
	CI->CO (FF)	0.13922	1.74981	24.83210
	CON->CO (RF)	0.02471	0.65585	9.55719

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (FR)	0.12069	0.84292	10.03250
	B->CON (FR)	0.10264	0.80580	9.81922
	CI->CON (FR)	0.09917	0.84215	10.33820
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.11461	0.83854	10.02250
	B->CON (FR)	0.09703	0.79996	9.81017
	CI->CON (FR)	0.09307	0.83282	10.32860

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (RF)	0.08788	0.64580	7.71383
	B->CON (RF)	0.08330	0.64125	7.75189
	CI->CON (RF)	0.08162	0.68540	8.41804
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.08445	0.64219	7.70933
	B->CON (RF)	0.08024	0.63816	7.74601
	CI->CON (RF)	0.07816	0.68349	8.41166

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-R)	0.23839	1.71169	24.23080
	B->S (-R)	0.25059	1.70169	23.25090
	CI->S (-R)	0.21521	1.70291	24.46030
	CON->S (RR)	0.07306	0.57349	7.21033
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.22890	1.58922	20.04360
	B->S (-R)	0.24150	1.59114	19.42160
	CI->S (-R)	0.20559	1.58173	20.29910
	CON->S (RR)	0.07325	0.61897	7.18021

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-F)	0.21146	1.50806	20.64690
	B->S (-F)	0.20600	1.44081	19.75840
	CI->S (-F)	0.20442	1.54356	21.27550
	CON->S (FF)	0.08602	0.63751	7.52660
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.20161	1.38621	16.90130
	B->S (-F)	0.19607	1.33304	16.33990
	CI->S (-F)	0.19448	1.42212	17.55240
	CON->S (FF)	0.08378	0.65558	7.19623

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00464	0.00669	0.05196
	B	0.00534	0.00711	0.04653
	CI	0.00756	0.00978	0.05547
sky130_osu_sc_18T_ms__addf_l	A	0.00342	0.00479	0.03297
	B	0.00415	0.00535	0.03018
	CI	0.00634	0.00790	0.03626

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01968	0.02188	0.08132
	B	0.02081	0.02247	0.07439
	CI	0.01645	0.01892	0.08005
sky130_osu_sc_18T_ms__addf_l	A	0.01848	0.02006	0.05959
	B	0.01959	0.02076	0.05507
	CI	0.01525	0.01715	0.05879

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01965	0.02073	0.04989
	B	0.02016	0.02124	0.04804
	CI	0.01643	0.01791	0.04947
sky130_osu_sc_18T_ms__addf_l	A	0.01846	0.01958	0.04803
	B	0.01898	0.01995	0.04623
	CI	0.01524	0.01647	0.04765

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00460	0.00592	0.02826
	B	0.00530	0.00642	0.02658
	CI	0.00752	0.00891	0.03203
sky130_osu_sc_18T_ms__addf_l	A	0.00339	0.00450	0.02514
	B	0.00412	0.00503	0.02353
	CI	0.00632	0.00756	0.02863

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01967	0.02182	0.07876
	B	0.02079	0.02241	0.07253
	CI	0.01644	0.01887	0.07755
sky130_osu_sc_18T_ms__addf_l	A	0.01848	0.02006	0.05939
	B	-0.01011	-0.00982	0.03976
	CI	0.01525	0.01715	0.05890

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.04440	0.04537	0.08839
	B	0.03931	0.04186	0.10562
	CI	0.03603	0.03668	0.07995
sky130_osu_sc_18T_ms__addf_l	A	0.04281	0.04343	0.08813
	B	0.03779	0.04007	0.10598
	CI	0.03451	0.03515	0.07999

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__addh_1	27.83880
sky130_osu_sc_18T_ms__addh_l	27.83880

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_18T_ms__addh_1	0.01047	0.01147	3.23073	1.65269	3.26671
sky130_osu_sc_18T_ms__addh_l	0.01047	0.01147	1.89568	1.65786	1.92725

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.93878	1.08874
sky130_osu_sc_18T_ms__addh_l	0.00000	0.63766	0.84766

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (RR)	0.08586	0.58607	7.09427
	B->CO (RR)	0.08955	0.58080	7.18352
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.08622	0.64964	6.96617
	B->CO (RR)	0.08994	0.64571	7.01139

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (FF)	0.07363	0.60364	7.51500
	B->CO (FF)	0.07939	0.61822	7.53731
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.07373	0.63923	6.96416
	B->CO (FF)	0.07929	0.65368	6.98707

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (RR)	B	0.11766	0.48430	3.79876
	A->CON (FR)	!B	0.06468	0.78463	10.17010
	B->CON (RR)	A	0.12116	0.47878	3.89502
	B->CON (FR)	!A	0.08195	0.79416	10.03470
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.10569	0.46277	3.80847
	A->CON (FR)	!B	0.05756	0.77764	10.18240
	B->CON (RR)	A	0.10922	0.45872	3.85966
	B->CON (FR)	!A	0.07480	0.78705	10.04830

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (FF)	B	0.11583	0.63611	6.04869
	A->CON (RF)	!B	0.05123	0.65213	8.47840
	B->CON (FF)	A	0.11394	0.67572	6.51442
	B->CON (RF)	!A	0.06083	0.63307	8.04981
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.10505	0.60570	5.87392
	A->CON (RF)	!B	0.04721	0.64819	8.48934
	B->CON (FF)	A	0.10319	0.64531	6.33644
	B->CON (RF)	!A	0.05691	0.62952	8.06081

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (RR)	!B	0.09063	1.59618	26.54230
	A->S (FR)	B	0.15565	1.56281	23.83650
	B->S (RR)	!A	0.10041	1.53266	25.16980
	B->S (FR)	A	0.15412	1.64690	25.23950
	CON->S (FR)	-	0.02721	0.69775	11.03000
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.09001	1.44526	20.02580
	A->S (FR)	B	0.14846	1.39217	17.24400
	B->S (RR)	!A	0.09999	1.39784	19.13850
	B->S (FR)	A	0.14684	1.46009	18.15180
	CON->S (FR)	-	0.03054	0.77852	10.91570

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (FF)	!B	0.10112	1.77682	29.62740
	A->S (RF)	B	0.14974	1.22955	17.92150
	B->S (FF)	!A	0.11841	1.79119	29.57490
	B->S (RF)	A	0.15321	1.22359	18.01350
	CON->S (RF)	-	0.02157	0.61704	9.83609
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.09757	1.56151	21.62130
	A->S (RF)	B	0.14035	1.10091	13.00340
	B->S (FF)	!A	0.11483	1.57299	21.51400
	B->S (RF)	A	0.14386	1.09595	13.04620
	CON->S (RF)	-	0.02443	0.66487	9.36699

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00893	0.00921	0.02710
	B	0.00000	0.00000	0.00000
	B	0.00794	0.00802	0.03200
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00729	0.00755	0.03013
	B	0.00000	0.00000	0.00000
	B	0.00630	0.00633	0.03251

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.01407	0.01505	0.04912
	B	0.00000	0.00000	0.00000
	B	0.01459	0.01657	0.05330
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01242	0.01323	0.04314
	B	0.00000	0.00000	0.00000
	B	0.01294	0.01456	0.04553

Internal switching power(pJ) to CON rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00893	0.00922	0.02867
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01233	0.01323	0.02464
	B	A	0.00000	0.00000	0.00000
	B	A	0.00793	0.00804	0.03352
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01394	0.01414	0.02176
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00729	0.00752	0.03026
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01123	0.01196	0.02181
	B	A	0.00000	0.00000	0.00000
	B	A	0.00630	0.00631	0.03272
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01283	0.01292	0.01881

Internal switching power(pJ) to CON falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01407	0.01499	0.04615
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00174	0.00233	0.01159
	B	A	0.00000	0.00000	0.00000
	B	A	0.01459	0.01643	0.04920
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00320	0.00358	0.01171
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01242	0.01321	0.04283
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00033	0.00062	0.00624
	B	A	0.00000	0.00000	0.00000
	B	A	0.01294	0.01452	0.04517
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00178	0.00190	0.00702

Internal switching power(pJ) to S rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01409	0.01508	0.04921
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00176	0.00260	0.01565
	B	A	0.00000	0.00000	0.00000
	B	A	0.01460	0.01663	0.05364
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00325	0.00376	0.01536
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01243	0.01324	0.04381
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00035	0.00068	0.00626
	B	A	0.00000	0.00000	0.00000
	B	A	0.01295	0.01455	0.04562
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00180	0.00188	0.00697

Internal switching power(pJ) to S falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00894	0.00928	0.02774
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01234	0.01324	0.02459
	B	A	0.00000	0.00000	0.00000
	B	A	0.00795	0.00806	0.03187
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01397	0.01438	0.02314
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00729	0.00753	0.03024
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01123	0.01192	0.02119
	B	A	0.00000	0.00000	0.00000
	B	A	0.00630	0.00638	0.03293
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01285	0.01297	0.01864

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__and2_1	12.45420
sky130_osu_sc_18T_ms__and2_2	15.38460
sky130_osu_sc_18T_ms__and2_4	21.24540
sky130_osu_sc_18T_ms__and2_6	27.10620
sky130_osu_sc_18T_ms__and2_8	32.96700
sky130_osu_sc_18T_ms__and2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__and2_1	0.00564	0.00575	3.23516
sky130_osu_sc_18T_ms__and2_2	0.00564	0.00575	6.15496
sky130_osu_sc_18T_ms__and2_4	0.00565	0.00576	11.70984
sky130_osu_sc_18T_ms__and2_6	0.00568	0.00576	17.23778
sky130_osu_sc_18T_ms__and2_8	0.00567	0.00578	21.91725
sky130_osu_sc_18T_ms__and2_l	0.00436	0.00446	2.22413

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.45359	0.72560
sky130_osu_sc_18T_ms__and2_2	0.00000	0.72560	0.72631
sky130_osu_sc_18T_ms__and2_4	0.00000	1.26962	1.45049
sky130_osu_sc_18T_ms__and2_6	0.00000	1.81364	2.17537
sky130_osu_sc_18T_ms__and2_8	0.00000	2.35766	2.90025
sky130_osu_sc_18T_ms__and2_l	0.00000	0.27537	0.44051

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	A->Y (RR)	0.06565	0.52369	7.00206
	B->Y (RR)	0.07015	0.52206	6.79989
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.07604	0.48224	6.94110
	B->Y (RR)	0.08056	0.47661	6.74595
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.10457	0.50596	7.14446
	B->Y (RR)	0.10914	0.49311	6.96876
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.13259	0.54638	7.35347
	B->Y (RR)	0.13711	0.52744	7.18774
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.16088	0.58769	7.45278
	B->Y (RR)	0.16546	0.56490	7.28286
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.07328	0.59302	6.98563
	B->Y (RR)	0.07812	0.59102	6.82191

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	**A->Y (FF)**	0.05775	0.53325	6.92999
	B->Y (FF)	0.06106	0.54611	6.96872
sky130_osu_sc_18T_ms__and2_2	**A->Y (FF)**	0.06492	0.49011	6.78660
	B->Y (FF)	0.06892	0.50242	6.85075
sky130_osu_sc_18T_ms__and2_4	**A->Y (FF)**	0.08811	0.50772	6.94675
	B->Y (FF)	0.09219	0.51695	7.00854
sky130_osu_sc_18T_ms__and2_6	**A->Y (FF)**	0.11453	0.54457	7.10315
	B->Y (FF)	0.11845	0.55261	7.16967
sky130_osu_sc_18T_ms__and2_8	**A->Y (FF)**	0.13880	0.57657	7.02036
	B->Y (FF)	0.14282	0.58385	7.08336
sky130_osu_sc_18T_ms__and2_l	**A->Y (FF)**	0.06275	0.58994	6.80321
	B->Y (FF)	0.06701	0.60514	6.86701

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00643	0.00994	0.09548
	B	0.00000	0.00000	0.00000
	B	0.00653	0.00855	0.06339
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01340	0.01543	0.10006
	B	0.00000	0.00000	0.00000
	B	0.01350	0.01447	0.06809
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02883	0.03108	0.11138
	B	0.00000	0.00000	0.00000
	B	0.02897	0.03026	0.07990
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.04626	0.04780	0.12480
	B	0.00000	0.00000	0.00000
	B	0.04642	0.04690	0.09523
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.06474	0.06439	0.13642
	B	0.00000	0.00000	0.00000
	B	0.06497	0.06311	0.11127
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00474	0.00616	0.06315
	B	0.00000	0.00000	0.00000
	B	0.00486	0.00525	0.04462

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.01680	0.02168	0.09910
	B	0.00000	0.00000	0.00000
	B	0.01898	0.02338	0.09683
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.02154	0.02674	0.10432
	B	0.00000	0.00000	0.00000
	B	0.02374	0.02835	0.10206
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.03437	0.03971	0.11659
	B	0.00000	0.00000	0.00000
	B	0.03646	0.04077	0.11424
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.04725	0.05226	0.12906
	B	0.00000	0.00000	0.00000
	B	0.04926	0.05325	0.12634
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.06332	0.06500	0.14262
	B	0.00000	0.00000	0.00000
	B	0.06514	0.06554	0.13779
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01302	0.01600	0.06499
	B	0.00000	0.00000	0.00000
	B	0.01466	0.01735	0.06465

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00652	-0.00656	-0.00656
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00651	-0.00656	-0.00656
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00651	-0.00656	-0.00655
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00653	-0.00658	-0.00658
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00649	-0.00654	-0.00654
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00480	-0.00483	-0.00483

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00655	0.00660	0.00659
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00655	0.00661	0.00659
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00656	0.00661	0.00660
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00660	0.00664	0.00663
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00657	0.00662	0.00661
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00482	0.00486	0.00485

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00618	-0.00622	-0.00619
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00618	-0.00622	-0.00619
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00617	-0.00622	-0.00618
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00617	-0.00621	-0.00617
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00616	-0.00620	-0.00617
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00455	-0.00456	-0.00456

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00624	0.00625	0.00621
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00625	0.00625	0.00622
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00625	0.00626	0.00622
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00626	0.00626	0.00623
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00626	0.00627	0.00624
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00459	0.00456	0.00457

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__aoi21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__aoi21_l	0.00537	0.00557	0.00538	1.51968

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.16617	0.36244

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (FR)	0.06617	0.78645	9.91233
	A1->Y (FR)	0.05650	0.74868	9.53395
	B0->Y (FR)	0.04740	0.78471	10.20440

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (RF)	0.04803	0.57392	7.19850
	A1->Y (RF)	0.04355	0.59917	7.65996
	B0->Y (RF)	0.02933	0.58610	7.68425

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.01545	0.01549	0.02503
	A1	0.00000	0.00000	0.00000
	A1	0.01300	0.01306	0.02249
	B0	0.00914	0.01029	0.02786

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00319	0.00283	0.00862
	A1	0.00000	0.00000	0.00000
	A1	0.00323	0.00317	0.01038
	B0	-0.00179	-0.00140	0.00521

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00493	-0.00582	-0.00581
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00586	-0.00587	-0.00587
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00586	-0.00587	-0.00587

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00576	0.00582	0.00581
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00586	0.00587	0.00589
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00592	0.00587	0.00589

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00489	-0.00571	-0.00575
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00579	-0.00584	-0.00580
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00624	-0.00629	-0.00628

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00571	0.00571	0.00575
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00580	0.00585	0.00582
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00627	0.00632	0.00630

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00264	-0.00266	-0.00266

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00287	0.00289	0.00272

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__aoi22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_18T_ms__aoi22_1	0.00538	0.00557	0.00574	0.00550	1.43358

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.18241	0.72488

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (FR)	0.08382	0.80318	9.73238
	A1->Y (FR)	0.07443	0.77903	9.54525
	B0->Y (FR)	0.04962	0.77319	9.85721
	B1->Y (FR)	0.05914	0.80122	10.12820

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (RF)	0.06354	0.58029	6.95556
	A1->Y (RF)	0.05912	0.60563	7.41815
	B0->Y (RF)	0.03176	0.57510	7.39362
	B1->Y (RF)	0.03557	0.54575	6.93264

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.01902	0.01896	0.02909
	A1	0.01659	0.01629	0.02661
	B0	0.00992	0.01122	0.03250
	B1	0.01236	0.01337	0.03431

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00675	0.00633	0.01249
	A1	0.00680	0.00665	0.01443
	B0	-0.00129	-0.00089	0.00692
	B1	-0.00113	-0.00110	0.00515

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00493	-0.00582	-0.00581
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00586	-0.00586	-0.00586
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00586	-0.00587	-0.00587
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00586	-0.00587	-0.00587

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00577	0.00584	0.00581
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00587	0.00587	0.00589
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00592	0.00587	0.00588
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00592	0.00587	0.00588

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00489	-0.00574	-0.00575
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00579	-0.00581	-0.00580
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00624	-0.00628	-0.00628
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00624	-0.00628	-0.00628

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00571	0.00574	0.00575
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00580	0.00586	0.00583
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00627	0.00632	0.00630
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00627	0.00632	0.00630

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00266	-0.00268	-0.00267
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00265	-0.00266	-0.00266
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00638	-0.00641	-0.00643
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00638	-0.00642	-0.00644

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00298	0.00299	0.00275
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00266	0.00268	0.00266
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00642	0.00648	0.00645
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00642	0.00648	0.00645

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00267	-0.00270	-0.00269
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00266	-0.00269	-0.00268
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00595	-0.00598	-0.00595
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00595	-0.00598	-0.00595

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00299	0.00300	0.00276
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00267	0.00269	0.00268
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00600	0.00599	0.00597
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00600	0.00599	0.00597

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__buf_1	9.52380
sky130_osu_sc_18T_ms__buf_2	12.45420
sky130_osu_sc_18T_ms__buf_4	18.31500
sky130_osu_sc_18T_ms__buf_6	24.17580
sky130_osu_sc_18T_ms__buf_8	30.03660
sky130_osu_sc_18T_ms__buf_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__buf_1	0.00575	3.19761
sky130_osu_sc_18T_ms__buf_2	0.00575	6.22743
sky130_osu_sc_18T_ms__buf_4	0.00575	11.90251
sky130_osu_sc_18T_ms__buf_6	0.00097	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00578	22.52087
sky130_osu_sc_18T_ms__buf_l	0.00450	2.22758

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.36316	0.36316
sky130_osu_sc_18T_ms__buf_2	0.00000	0.54474	0.72560
sky130_osu_sc_18T_ms__buf_4	0.00000	0.90789	1.45049
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	1.63421	2.90026
sky130_osu_sc_18T_ms__buf_l	0.00000	0.22040	0.22040

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (RR)**	0.05188	0.49061	6.65852
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.05824	0.44381	6.69644
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.07846	0.45215	6.88547
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.11725	0.51280	7.16639
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.05797	0.55840	6.71211

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (FF)**	0.05491	0.52438	6.89633
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.06284	0.48858	6.94207
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.08607	0.50585	7.08348
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.13653	0.57629	7.22115
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.06060	0.58486	6.85361

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00598	0.00827	0.07241
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01284	0.01517	0.07780
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02788	0.03098	0.09210
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.06045	0.06302	0.11946
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00454	0.00600	0.05192

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.01607	0.02103	0.09863
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.02081	0.02599	0.10336
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.03350	0.03846	0.11533
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.06243	0.06332	0.13950
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01259	0.01569	0.06558

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00085	-0.00086	-0.00084

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	0.00085	0.00086	0.00084

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__dffr_1	63.73620
sky130_osu_sc_18T_ms__dffr_l	63.73620

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_18T_ms__dffr_1	0.00553	0.00548	0.01572	3.11223	3.10262
sky130_osu_sc_18T_ms__dffr_l	0.00553	0.00548	0.01570	2.22929	2.22245

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	1.10032	1.70701
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.95756	1.56426

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RR)	0.24280	1.26504	16.64220
	QN->Q (FR)	0.02837	0.76231	12.00290
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.23968	1.37295	16.42230
	QN->Q (FR)	0.03006	0.80502	11.71220

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RF)	0.25080	1.29481	17.17060
	QN->Q (RF)	0.02668	0.73921	11.64820
	RN->Q (FF)	0.18782	1.30055	17.98120
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.25410	1.42037	17.04120
	QN->Q (RF)	0.02726	0.74618	10.88540
	RN->Q (FF)	0.19145	1.42603	17.84440

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->QN (RR)	0.21972	0.68508	6.74017
	RN->QN (FR)	0.15677	0.69104	7.54812
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.21989	0.73937	6.81130
	RN->QN (FR)	0.15721	0.74514	7.61318

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	**CK->QN (RF)**	0.20772	0.66383	6.38750
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.20068	0.68510	6.12189

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.05693	-0.07376	0.01994
	setup	CK (R)	0.19155	0.23230	0.78523
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.06087	-0.07386	0.01958
	setup	CK (R)	0.19416	0.22934	0.77916

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.09639	-0.29100	-1.26578
	setup	CK (R)	0.12296	0.30157	2.87219
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09546	-0.29152	-1.10429
	setup	CK (R)	0.12296	0.30157	2.87214

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.05693	-0.07376	0.01994
	setup	CK (R)	0.19155	0.23230	0.78523
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.06087	-0.07386	0.01958
	setup	CK (R)	0.19416	0.22934	0.77916

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.09639	-0.29100	-1.26578
	setup	CK (R)	0.12296	0.30157	2.87219
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09546	-0.29152	-1.10429
	setup	CK (R)	0.12296	0.30157	2.87214

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.15492	0.19463	1.02957
	removal	CK (R)	-0.03201	-0.03784	-0.10790
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.15574	0.19507	1.04033
	removal	CK (R)	-0.03201	-0.03784	-0.10790

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.15492	0.19463	1.02957
	removal	CK (R)	-0.03201	-0.03784	-0.10790
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.15574	0.19507	1.04033
	removal	CK (R)	-0.03201	-0.03784	-0.10790

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	RN ()	0.11040	0.50415	13.33370
	min_pulse_width	RN ()	0.11040	0.50415	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.10661	0.50415	13.33370
	min_pulse_width	RN ()	0.10661	0.50415	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	CK ()	0.11418	0.50415	13.33370
	min_pulse_width	CK ()	0.12933	0.50415	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.10661	0.50415	13.33370
	min_pulse_width	CK ()	0.12554	0.50415	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	CK ()	0.24670	0.50415	13.33370
	min_pulse_width	CK ()	0.10282	0.50415	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.24670	0.50415	13.33370
	min_pulse_width	CK ()	0.10282	0.50415	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01630	0.01270	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01446	0.01278	0.02638

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01868	0.01568	0.00000
	RN	-0.00210	-0.15671	-2.77926
	RN	0.04357	0.04160	0.02684
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01684	0.01537	0.03054
	RN	-0.00210	-0.12828	-1.99080
	RN	0.04171	0.04127	0.05957

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01867	0.01568	0.00000
	RN	-0.00210	-0.15642	-2.76948
	RN	0.04354	0.04158	0.02701
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01682	0.01537	0.03060
	RN	-0.00210	-0.12804	-1.98437
	RN	0.04169	0.04126	0.05925

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01624	0.01261	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01440	0.01275	0.02610

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00480	-0.00568	-0.00577
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02048	0.02044	0.07175
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00905	0.00919	0.06059
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00480	-0.00568	-0.00577
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02048	0.02044	0.07175
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00905	0.00918	0.06059

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00576	0.00586	0.00580
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03444	0.03524	0.08937
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01628	0.01716	0.07024
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00576	0.00586	0.00580
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03444	0.03524	0.08936
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01627	0.01716	0.07024

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00615	0.00853	0.10422
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01774	0.01976	0.11747
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00614	0.00853	0.10421
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01774	0.01976	0.11747

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01521	0.01987	0.11763
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03276	0.03691	0.13605
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01521	0.01987	0.11763
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03275	0.03690	0.13605

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00151	0.00024	0.09552
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00976	0.01031	0.10956
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00215	-0.00024	0.09405
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00151	0.00024	0.09552
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00976	0.01031	0.10952
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00215	-0.00024	0.09405

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02315	0.02797	0.12549
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05174	0.05468	0.17132
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03965	0.04302	0.14287
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.05052	0.05859	0.21888
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02681	0.03139	0.12764
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02315	0.02797	0.12549
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05174	0.05467	0.17131
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03964	0.04303	0.14287
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.05052	0.05859	0.21888
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02681	0.03139	0.12764

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__dffsr_1	69.59700
sky130_osu_sc_18T_ms__dffsr_l	69.59700

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffsr_1	0.00549	0.00549	0.01177	0.01603	3.28060	3.27821
sky130_osu_sc_18T_ms__dffsr_l	0.00549	0.00549	0.01176	0.01603	2.22545	2.22359

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffsr_1	0.00000	1.22277	1.70768
sky130_osu_sc_18T_ms__dffsr_l	0.00000	1.08001	1.56492

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RR)	0.24996	1.26271	16.72590
	QN->Q (FR)	0.02688	0.74338	11.83920
	RN->Q (RR)	0.20078	1.22465	16.75850
	SN->Q (FR)	0.18250	1.28657	17.76500
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.25388	1.39060	16.40140
	QN->Q (FR)	0.02999	0.80185	11.67050
	RN->Q (RR)	0.20513	1.35307	16.42720
	SN->Q (FR)	0.18661	1.41081	17.43100

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RF)	0.28287	1.31532	17.28490
	QN->Q (RF)	0.02432	0.69546	11.10320
	RN->Q (FF)	0.19162	1.29735	18.08390
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.29018	1.45810	17.02940
	QN->Q (RF)	0.02720	0.74339	10.85950
	RN->Q (FF)	0.19878	1.43945	17.83180

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RR)	0.25272	0.71989	6.87385
	RN->QN (FR)	0.16187	0.70196	7.67295
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.25556	0.77851	6.84818
	RN->QN (FR)	0.16448	0.76029	7.64197

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RF)	0.21692	0.67049	6.41269
	RN->QN (RF)	0.16810	0.63281	6.44138
	SN->QN (FF)	0.14982	0.69458	7.44619
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.21555	0.70498	6.15226
	RN->QN (RF)	0.16718	0.66810	6.17822
	SN->QN (FF)	0.14868	0.72549	7.17658

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.06104	-0.07968	-0.01943
	setup	CK (R)	0.19438	0.22909	0.79367
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.06144	-0.07968	-0.01974
	setup	CK (R)	0.19022	0.22839	0.79770

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.10924	-0.30527	-1.27103
	setup	CK (R)	0.14056	0.31824	2.91736
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11001	-0.30703	-1.25538
	setup	CK (R)	0.13876	0.32000	2.91746

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.06104	-0.07968	-0.01943
	setup	CK (R)	0.19438	0.22909	0.79367
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.06144	-0.07968	-0.01974
	setup	CK (R)	0.19022	0.22839	0.79770

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.10924	-0.30527	-1.27103
	setup	CK (R)	0.14056	0.31824	2.91736
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11001	-0.30703	-1.25538
	setup	CK (R)	0.13876	0.32000	2.91746

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.14032	0.17973	0.98247
	removal	CK (R)	-0.01868	-0.02287	-0.06403
	hold	SN (R)	-0.14064	-0.28919	-1.19935
	setup	SN (R)	0.16496	0.34333	5.07463
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.14048	0.17908	0.97865
	removal	CK (R)	-0.01819	-0.02424	-0.06225
	hold	SN (R)	-0.13942	-0.28494	-1.17092
	setup	SN (R)	0.16595	0.33677	4.95846

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.14032	0.17973	0.98247
	removal	CK (R)	-0.01868	-0.02287	-0.06403
	hold	SN (R)	-0.14193	-0.28919	-1.19935
	hold	SN (R)	-0.14064	-0.29127	-1.20249
	setup	SN (R)	0.16496	0.34123	4.82434
	setup	SN (R)	0.16090	0.34333	5.07463
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.14048	0.17908	0.97865
	removal	CK (R)	-0.01819	-0.02424	-0.06225
	hold	SN (R)	-0.14056	-0.28497	-1.17154
	hold	SN (R)	-0.13942	-0.28494	-1.17092
	setup	SN (R)	0.16595	0.33386	4.73100
	setup	SN (R)	0.15275	0.33677	4.95846

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	RN ()	0.12554	0.50415	13.33370
	min_pulse_width	RN ()	0.12554	0.50415	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.12554	0.50415	13.33370
	min_pulse_width	RN ()	0.12176	0.50415	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.04077	0.07836	4.93834
	removal	CK (R)	-0.01722	-0.06239	-0.27853
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.04020	0.07828	4.76678
	removal	CK (R)	-0.01722	-0.06239	-0.27853

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.04077	0.07836	4.93834
	removal	CK (R)	-0.01722	-0.06239	-0.27853
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.04020	0.07828	4.76678
	removal	CK (R)	-0.01722	-0.06239	-0.27853

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	SN ()	0.14447	0.50415	13.33370
	min_pulse_width	SN ()	0.14447	0.50415	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.14447	0.50415	13.33370
	min_pulse_width	SN ()	0.13690	0.50415	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.11418	0.50415	13.33370
	min_pulse_width	CK ()	0.14447	0.50415	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.11040	0.50415	13.33370
	min_pulse_width	CK ()	0.14069	0.50415	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.24670	0.50415	13.33370
	min_pulse_width	CK ()	0.12176	0.50415	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.24670	0.50415	13.33370
	min_pulse_width	CK ()	0.12176	0.50415	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02061	0.01877	0.01953
	RN	0.03777	0.03511	0.01890
	SN	-0.00210	-0.16174	-2.92966
	SN	0.04249	0.03884	0.01251
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01891	0.01712	0.03077
	RN	0.03606	0.03341	0.03118
	SN	-0.00210	-0.12815	-1.98738
	SN	0.04078	0.03714	0.02339

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02179	0.01945	0.01012
	RN	-0.00210	-0.16174	-2.92964
	RN	0.04491	0.04331	0.03791
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02008	0.01879	0.03599
	RN	-0.00210	-0.12815	-1.98737
	RN	0.04318	0.04264	0.06260

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02176	0.01942	0.01009
	RN	-0.00210	-0.16168	-2.92693
	RN	0.04486	0.04326	0.03759
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02006	0.01876	0.03491
	RN	-0.00210	-0.12808	-1.98538
	RN	0.04314	0.04258	0.06227

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02054	0.01875	0.01818
	RN	0.03770	0.03505	0.01844
	SN	-0.00210	-0.16168	-2.92733
	SN	0.04242	0.03878	0.01230
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01884	0.01714	0.03042
	RN	0.03598	0.03333	0.03105
	SN	-0.00210	-0.12808	-1.98557
	SN	0.04071	0.03709	0.02441

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00565	-0.00575	-0.00577
	(!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)	0.02625	0.02619	0.07728
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01021	0.01031	0.06131
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01019	0.01030	0.06135
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01026	0.01037	0.06138
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00565	-0.00575	-0.00577
	(!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)	0.02625	0.02619	0.07728
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01021	0.01030	0.06131
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01019	0.01030	0.06135
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01026	0.01036	0.06138

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00579	0.00580	0.00577
	(!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)	0.03918	0.03975	0.09284
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01698	0.01791	0.07069
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01727	0.01806	0.07069
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01692	0.01784	0.07062
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00578	0.00580	0.00577
	(!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)	0.03917	0.03974	0.09283
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01697	0.01789	0.07067
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01726	0.01805	0.07068
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01691	0.01783	0.07061

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.00478	0.00679	0.10268
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02107	0.02262	0.12108
sky130_osu_sc_18T_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)	0.00478	0.00680	0.10269
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02108	0.02263	0.12109

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.01607	0.02104	0.11918
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03433	0.03849	0.13823
sky130_osu_sc_18T_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)	0.01605	0.02103	0.11917
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03432	0.03847	0.13821

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	-0.01294	-0.01303	-0.01302
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01174	-0.01336	-0.01334
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01205	-0.01288	-0.01285
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00881	0.00915	0.06317
sky130_osu_sc_18T_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)	-0.01294	-0.01303	-0.01302
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01171	-0.01334	-0.01332
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01204	-0.01287	-0.01284
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00887	0.00916	0.06318

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.01303	0.01312	0.01308
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01331	0.01336	0.01340
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01285	0.01296	0.01291
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02702	0.02713	0.08018
sky130_osu_sc_18T_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)	0.01303	0.01312	0.01308
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01328	0.01334	0.01338
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01284	0.01296	0.01290
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02700	0.02716	0.08017

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00151	0.00024	0.09557
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01101	0.01164	0.11069
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01068	0.01138	0.11054
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00187	0.00006	0.09438
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00686	0.01023	0.18340
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00151	0.00024	0.09557
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01100	0.01163	0.11068
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01067	0.01136	0.11052
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00187	0.00005	0.09438
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00686	0.01023	0.18340

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_18T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.05787	0.06081	0.17703
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02322	0.02803	0.12561
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.04044	0.04384	0.14331
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.04051	0.04414	0.14347
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.05521	0.06279	0.22326
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02660	0.03117	0.12747
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03104	0.03932	0.21598
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.05787	0.06082	0.17703
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02322	0.02803	0.12561
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.04044	0.04384	0.14331
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.04050	0.04410	0.14344
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.05520	0.06278	0.22324
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02660	0.03117	0.12747
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03102	0.03931	0.21597

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__dffs_1	57.87540
sky130_osu_sc_18T_ms__dffs_l	57.87540

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffs_1	0.00552	0.00933	0.01581	3.16020	3.12408
sky130_osu_sc_18T_ms__dffs_l	0.00552	0.00933	0.01581	2.23098	2.23035

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	1.09144	1.60810
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.94868	1.46534

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RR)	0.18945	1.20681	16.73650
	QN->Q (FR)	0.02819	0.76093	12.00630
	SN->Q (FR)	0.14434	1.27844	17.72320
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.19010	1.31233	16.30190
	QN->Q (FR)	0.02990	0.80074	11.65250
	SN->Q (FR)	0.14572	1.37859	17.25960

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RF)	0.27573	1.33085	17.39210
	QN->Q (RF)	0.02646	0.73850	11.70270
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.27774	1.44587	17.02910
	QN->Q (RF)	0.02710	0.74199	10.84770

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RR)	0.24362	0.71497	6.77197
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.24265	0.76646	6.83096

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RF)	0.15707	0.60215	6.32645
	SN->QN (FF)	0.11179	0.67382	7.30445
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.15385	0.62853	6.05082
	SN->QN (FF)	0.10894	0.69417	7.00670

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.04591	-0.05693	0.04408
	setup	CK (R)	0.13750	0.18157	0.85232
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.04310	-0.06026	0.04320
	setup	CK (R)	0.13759	0.18144	0.90117

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.10046	-0.29192	-0.46630
	setup	CK (R)	0.13352	0.30365	2.88511
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09784	-0.29192	-0.43336
	setup	CK (R)	0.13344	0.30365	2.88507

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.04591	-0.05693	0.04408
	setup	CK (R)	0.13750	0.18157	0.85232
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.04310	-0.06026	0.04320
	setup	CK (R)	0.13759	0.18144	0.90117

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.10046	-0.29192	-0.46630
	setup	CK (R)	0.13352	0.30365	2.88511
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09784	-0.29192	-0.43336
	setup	CK (R)	0.13344	0.30365	2.88507

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.03816	0.07526	3.71315
	removal	CK (R)	-0.01756	-0.05824	-0.32054
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03782	0.07512	3.58561
	removal	CK (R)	-0.01756	-0.05824	-0.32054

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.03816	0.07526	3.71315
	removal	CK (R)	-0.01756	-0.05824	-0.32054
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03782	0.07512	3.58561
	removal	CK (R)	-0.01756	-0.05824	-0.32054

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	SN ()	0.09525	0.50415	13.33370
	min_pulse_width	SN ()	0.09904	0.50415	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.09525	0.50415	13.33370
	min_pulse_width	SN ()	0.09147	0.50415	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	CK ()	0.08389	0.50415	13.33370
	min_pulse_width	CK ()	0.13690	0.50415	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.08011	0.50415	13.33370
	min_pulse_width	CK ()	0.13311	0.50415	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	CK ()	0.18990	0.50415	13.33370
	min_pulse_width	CK ()	0.11418	0.50415	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.18990	0.50415	13.33370
	min_pulse_width	CK ()	0.11418	0.50415	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01628	0.01264	-0.00113
	SN	-0.00210	-0.15816	-2.82214
	SN	0.02954	0.02544	-0.01789
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01445	0.01275	0.02737
	SN	-0.00210	-0.12834	-1.99232
	SN	0.03395	0.03158	0.02348

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01854	0.01575	0.00113
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01668	0.01543	0.03288

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01853	0.01579	0.00330
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01667	0.01538	0.03277

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01621	0.01268	-0.00330
	SN	-0.00210	-0.15707	-2.78952
	SN	0.02950	0.02544	-0.01765
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01439	0.01281	0.02691
	SN	-0.00210	-0.12832	-1.99161
	SN	0.03389	0.03149	0.02618

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00572	-0.00582	-0.00583
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01949	0.01947	0.07269
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00881	0.00894	0.06040
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00572	-0.00582	-0.00583
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01949	0.01947	0.07269
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00881	0.00894	0.06040

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00585	0.00586	0.00583
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03316	0.03381	0.08765
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01631	0.01726	0.07058
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00585	0.00586	0.00583
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03316	0.03381	0.08765
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01631	0.01726	0.07058

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00957	-0.00966	-0.00963
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00686	0.00776	0.06187
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00957	-0.00966	-0.00963
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00686	0.00776	0.06187

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00965	0.00973	0.00967
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01867	0.02024	0.07730
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00965	0.00973	0.00967
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01867	0.02024	0.07730

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00154	0.00021	0.09565
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00202	-0.00010	0.09434
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00539	0.00900	0.18342
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00154	0.00021	0.09565
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00203	-0.00010	0.09434
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00538	0.00900	0.18342

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.05100	0.05397	0.17202
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02316	0.02799	0.12565
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04909	0.05691	0.21731
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02667	0.03119	0.12764
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.03023	0.03868	0.21635
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.05100	0.05397	0.17202
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02316	0.02800	0.12565
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04909	0.05691	0.21731
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02666	0.03119	0.12764
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.03023	0.03868	0.21635

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__dff_1	48.35160
sky130_osu_sc_18T_ms__dff_l	48.35160

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_18T_ms__dff_1	0.00567	0.01567	3.30110	3.29921
sky130_osu_sc_18T_ms__dff_l	0.00567	0.01567	2.18359	2.19558

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	1.12843	1.45254
sky130_osu_sc_18T_ms__dff_l	0.00000	0.98567	1.30978

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RR)	0.16903	1.16887	16.65410
	QN->Q (FR)	0.02668	0.74008	11.81960
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.17552	1.29338	16.04250
	QN->Q (FR)	0.03052	0.80944	11.71040

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RF)	0.23366	1.26150	17.28620
	QN->Q (RF)	0.02420	0.69395	11.10590
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.24232	1.40107	16.79240
	QN->Q (RF)	0.02715	0.73692	10.70470

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RR)	0.20446	0.66518	6.83302
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.20831	0.72842	6.79811

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RF)	0.13878	0.57758	6.30565
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.13970	0.61229	5.93834

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.03946	-0.05423	0.02893
	setup	CK (R)	0.11510	0.16287	1.00429
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.04041	-0.05824	0.03106
	setup	CK (R)	0.11460	0.16120	0.95304

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.09073	-0.29118	-0.30312
	setup	CK (R)	0.11071	0.30349	2.87587
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.08953	-0.29118	-0.33342
	setup	CK (R)	0.11071	0.30349	2.87587

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	min_pulse_width	CK ()	0.07632	0.50415	13.33370
	min_pulse_width	CK ()	0.12176	0.50415	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.07632	0.50415	13.33370
	min_pulse_width	CK ()	0.12176	0.50415	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	**min_pulse_width**	**CK ()**	0.16719	0.50415	13.33370
	min_pulse_width	**CK ()**	0.08768	0.50415	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.16719	0.50415	13.33370
	min_pulse_width	**CK ()**	0.08389	0.50415	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01712	0.01538	0.01918
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01544	0.01377	0.03105

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01889	0.01671	0.00942
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01724	0.01577	0.03048

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01888	0.01669	0.00960
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01722	0.01577	0.03000

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01707	0.01539	0.01790
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01539	0.01384	0.03103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00481	-0.00567	-0.00576
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01820	0.01853	0.07274
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00481	-0.00569	-0.00576
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01820	0.01853	0.07274

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00574	0.00583	0.00579
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03407	0.03486	0.09018
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00574	0.00583	0.00579
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03408	0.03487	0.09019

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00155	0.00021	0.09566
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00201	-0.00006	0.09438
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00155	0.00021	0.09565
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00201	-0.00007	0.09438

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02308	0.02792	0.12556
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04982	0.05291	0.17151
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04982	0.05791	0.22029
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02656	0.03116	0.12753
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02308	0.02792	0.12556
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04982	0.05292	0.17151
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04982	0.05792	0.22030
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02656	0.03116	0.12753

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__inv_1	6.59340
sky130_osu_sc_18T_ms__inv_10	32.96700
sky130_osu_sc_18T_ms__inv_2	9.52380
sky130_osu_sc_18T_ms__inv_3	12.45420
sky130_osu_sc_18T_ms__inv_4	15.38460
sky130_osu_sc_18T_ms__inv_6	21.24540
sky130_osu_sc_18T_ms__inv_8	27.10620
sky130_osu_sc_18T_ms__inv_l	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__inv_1	0.00552	3.08694
sky130_osu_sc_18T_ms__inv_10	0.05219	26.35598
sky130_osu_sc_18T_ms__inv_2	0.01063	5.94206
sky130_osu_sc_18T_ms__inv_3	0.01585	8.55818
sky130_osu_sc_18T_ms__inv_4	0.02099	11.43952
sky130_osu_sc_18T_ms__inv_6	0.03147	16.85569
sky130_osu_sc_18T_ms__inv_8	0.04184	21.94738
sky130_osu_sc_18T_ms__inv_l	0.00425	2.09999

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.18158	0.36245
sky130_osu_sc_18T_ms__inv_10	0.00000	1.81578	3.62442
sky130_osu_sc_18T_ms__inv_2	0.00000	0.36316	0.72489
sky130_osu_sc_18T_ms__inv_3	0.00000	0.54474	1.08733
sky130_osu_sc_18T_ms__inv_4	0.00000	0.72631	1.44977
sky130_osu_sc_18T_ms__inv_6	0.00000	1.08947	2.17466
sky130_osu_sc_18T_ms__inv_8	0.00000	1.45262	2.89954
sky130_osu_sc_18T_ms__inv_l	0.00000	0.11020	0.22012

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (FR)**	0.02499	0.66646	10.40190
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.04102	0.45275	10.23670
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.02124	0.57584	10.26490
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.02392	0.54263	10.34090
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.02509	0.51201	10.28530
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.02913	0.48025	10.32060
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.03469	0.46237	10.28100
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.02816	0.72975	10.44520

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (RF)**	0.02161	0.60289	9.44201
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.03841	0.37873	8.98740
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.01864	0.51170	9.27247
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.02079	0.47603	9.32582
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.02125	0.44638	9.28251
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.02723	0.41431	9.27258
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.03258	0.39362	9.18974
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.02407	0.64429	9.22766

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00848	0.01033	0.02662
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.07550	0.10322	0.26169
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01528	0.02028	0.05126
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.02339	0.03009	0.07727
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.03023	0.04184	0.10207
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.04495	0.06165	0.15335
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.05987	0.08144	0.20619
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00656	0.00755	0.01786

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	**A**	0.00000	0.00000	0.00000
	A	-0.00212	-0.00154	0.00410
sky130_osu_sc_18T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.02690	-0.02183	0.03752
sky130_osu_sc_18T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00634	-0.00471	0.00654
sky130_osu_sc_18T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00847	-0.00579	0.01099
sky130_osu_sc_18T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.01260	-0.00926	0.01331
sky130_osu_sc_18T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01915	-0.01367	0.02059
sky130_osu_sc_18T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.02448	-0.01719	0.02797
sky130_osu_sc_18T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00151	-0.00115	0.00330

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__mux2_1	18.31500

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_18T_ms__mux2_1	0.03336	0.03315	0.01121	0.02482

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.36526	0.37057

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (RR)	-	0.01359	0.06993	0.16865
	A1->Y (RR)	-	0.01450	0.07004	0.16848
	S0->Y (RR)	(!A0 * A1)	0.04382	0.14023	-0.00121
	S0->Y (FR)	(A0 * !A1)	0.03790	0.17636	0.91799

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (FF)	-	0.01181	0.07782	0.18801
	A1->Y (FF)	-	0.01184	0.07745	0.18751
	S0->Y (FF)	(!A0 * A1)	0.05505	0.20191	0.82282
	S0->Y (RF)	(A0 * !A1)	0.02638	0.11699	0.11321

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00879	-0.00881	-0.00884
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00607	-0.00606	-0.00609
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00984	0.01525	0.11415
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00625	-0.00336	0.09317

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00879	0.00882	0.00884
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00607	0.00609	0.00609
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00154	0.00520	0.10337
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.02298	0.02781	0.12551

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00219	-0.00218	-0.00218

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00219	0.00218	0.00218

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00259	-0.00258	-0.00259

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00259	0.00258	0.00259

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00239	0.00085	0.09805
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00235	0.00098	0.09840

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.01733	0.02276	0.12022
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01551	0.02136	0.11951

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__nand2_1	9.52380
sky130_osu_sc_18T_ms__nand2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00554	0.00551	2.58192
sky130_osu_sc_18T_ms__nand2_l	0.00426	0.00424	1.73912

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.18158	0.72489
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.11022	0.44023

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (FR)	0.02544	0.63580	9.45123
	B->Y (FR)	0.03015	0.63346	9.34118
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.02853	0.68800	9.41099
	B->Y (FR)	0.03428	0.69000	9.36915

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (RF)	0.02961	0.70178	10.62560
	B->Y (RF)	0.03388	0.67762	10.22540
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.03354	0.76046	10.36700
	B->Y (RF)	0.03762	0.73492	9.94511

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00905	0.01073	0.02647
	B	0.00000	0.00000	0.00000
	B	0.01154	0.01311	0.02921
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00694	0.00748	0.01793
	B	0.00000	0.00000	0.00000
	B	0.00877	0.00921	0.01979

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00157	-0.00118	0.00443
	B	0.00000	0.00000	0.00000
	B	-0.00148	-0.00138	0.00315
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00115	-0.00095	0.00353
	B	0.00000	0.00000	0.00000
	B	-0.00110	-0.00105	0.00256

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00642	-0.00646	-0.00646
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00469	-0.00471	-0.00471

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00646	0.00650	0.00648
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00470	0.00474	0.00473

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00600	-0.00604	-0.00600
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00437	-0.00441	-0.00438

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00605	0.00606	0.00602
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00441	0.00441	0.00439

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__nor2_1	9.52380
sky130_osu_sc_18T_ms__nor2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nor2_1	0.00554	0.00584	1.67162
sky130_osu_sc_18T_ms__nor2_l	0.00419	0.00452	1.14796

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.12357	0.36244
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.07964	0.22011

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (FR)	0.04968	0.76236	10.06240
	B->Y (FR)	0.03695	0.75879	10.19910
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.05525	0.84005	10.03430
	B->Y (FR)	0.04395	0.84695	10.32370

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (RF)	0.02978	0.50475	6.64512
	B->Y (RF)	0.02312	0.49224	6.62450
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.03185	0.53584	6.52794
	B->Y (RF)	0.02564	0.52775	6.51031

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.01258	0.01281	0.02287
	B	0.00000	0.00000	0.00000
	B	0.00926	0.01066	0.03140
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00918	0.00927	0.01623
	B	0.00000	0.00000	0.00000
	B	0.00706	0.00778	0.02072

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00121	0.00133	0.00915
	B	0.00000	0.00000	0.00000
	B	-0.00163	-0.00107	0.00660
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00081	0.00103	0.00708
	B	0.00000	0.00000	0.00000
	B	-0.00109	-0.00073	0.00529

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00483	-0.00579	-0.00579
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00349	-0.00411	-0.00411

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00575	0.00583	0.00580
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00409	0.00414	0.00411

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00265	-0.00267	-0.00266
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00198	-0.00199	-0.00199

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00277	0.00279	0.00270
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00206	0.00207	0.00201

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__oai21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__oai21_l	0.00559	0.00566	0.00472	1.63652

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.14458	0.58256

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (FR)	0.04961	0.77009	10.14390
	A1->Y (FR)	0.06600	0.77907	10.01420
	B0->Y (FR)	0.03514	0.67406	9.01214

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (RF)	0.04280	0.61176	7.98788
	A1->Y (RF)	0.05185	0.60658	7.76397
	B0->Y (RF)	0.03279	0.65012	8.67867

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.01281	0.01397	0.03131
	A1	0.00000	0.00000	0.00000
	A1	0.01612	0.01618	0.02531
	B0	0.01086	0.01159	0.02608

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00014	0.00010	0.00542
	A1	0.00000	0.00000	0.00000
	A1	0.00298	0.00268	0.00806
	B0	0.00089	0.00123	0.00740

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00266	-0.00268	-0.00267
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00572	-0.00584	-0.00581
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00589	-0.00592	-0.00589

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00278	0.00280	0.00271
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00579	0.00584	0.00581
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00589	0.00594	0.00591

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00477	-0.00573	-0.00571
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00568	-0.00579	-0.00577
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00583	-0.00587	-0.00584

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00568	0.00578	0.00572
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00573	0.00579	0.00577
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00584	0.00588	0.00586

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00477	-0.00481	-0.00485

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00484	0.00488	0.00487

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__oai22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__oai22_1	0.00544	0.00570	0.00584	0.00572	1.64454

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.18533	0.72488

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (FR)	0.06758	0.78015	9.99575
	A1->Y (FR)	0.05869	0.77594	10.13850
	B0->Y (FR)	0.04211	0.76140	10.13790
	B1->Y (FR)	0.05507	0.76831	10.00370

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (RF)	0.07642	0.66284	8.19855
	A1->Y (RF)	0.05977	0.63676	8.06782
	B0->Y (RF)	0.05016	0.67189	8.73343
	B1->Y (RF)	0.06789	0.71085	9.02601

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.02110	0.02113	0.02943
	A1	0.01779	0.01891	0.03589
	B0	0.00988	0.01135	0.02961
	B1	0.01669	0.01683	0.02519

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00199	0.00166	0.00712
	A1	-0.00076	-0.00081	0.00465
	B0	-0.00080	-0.00048	0.00653
	B1	0.00198	0.00191	0.00871

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00482	-0.00579	-0.00579
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00482	-0.00579	-0.00579
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00568	-0.00584	-0.00578
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00584	-0.00586	-0.00585

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00576	0.00582	0.00581
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00577	0.00582	0.00581
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00576	0.00584	0.00578
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00584	0.00590	0.00587

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00264	-0.00265	-0.00265
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00264	-0.00265	-0.00265
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00566	-0.00577	-0.00575
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00582	-0.00585	-0.00584

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00276	0.00278	0.00269
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00276	0.00278	0.00269
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00572	0.00577	0.00575
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00583	0.00587	0.00585

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00262	-0.00264	-0.00263
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00262	-0.00264	-0.00263
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00626	-0.00638	-0.00634
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00629	-0.00634	-0.00641

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00274	0.00276	0.00267
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00274	0.00277	0.00267
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00634	0.00638	0.00634
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00641	0.00646	0.00643

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00478	-0.00572	-0.00572
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00478	-0.00572	-0.00572
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00635	-0.00649	-0.00643
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00638	-0.00641	-0.00649

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00569	0.00575	0.00573
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00569	0.00574	0.00573
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00643	0.00651	0.00643
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00648	0.00653	0.00651

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__or2_1	12.45420
sky130_osu_sc_18T_ms__or2_2	15.38460
sky130_osu_sc_18T_ms__or2_4	21.24540
sky130_osu_sc_18T_ms__or2_8	32.96700
sky130_osu_sc_18T_ms__or2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__or2_1	0.00587	0.00567	3.20493
sky130_osu_sc_18T_ms__or2_2	0.00588	0.00567	6.13668
sky130_osu_sc_18T_ms__or2_4	0.00588	0.00568	11.67894
sky130_osu_sc_18T_ms__or2_8	0.00589	0.00570	22.04377
sky130_osu_sc_18T_ms__or2_l	0.00459	0.00435	2.15980

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.21472	0.36387
sky130_osu_sc_18T_ms__or2_2	0.00000	0.30586	0.72631
sky130_osu_sc_18T_ms__or2_4	0.00000	0.48816	1.45120
sky130_osu_sc_18T_ms__or2_8	0.00000	0.85274	2.90097
sky130_osu_sc_18T_ms__or2_l	0.00000	0.13488	0.22068

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (RR)	0.06239	0.52557	6.58474
	B->Y (RR)	0.05371	0.49385	6.55348
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.06932	0.47336	6.56181
	B->Y (RR)	0.06033	0.44546	6.51509
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.08998	0.47807	6.78436
	B->Y (RR)	0.08076	0.45514	6.72285
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.12888	0.53303	7.14281
	B->Y (RR)	0.11942	0.51551	7.08526
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.06867	0.59091	6.53287
	B->Y (RR)	0.06026	0.56109	6.48704

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (FF)	0.09376	0.59679	7.18347
	B->Y (FF)	0.07665	0.57611	7.25822
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.11022	0.56479	7.14478
	B->Y (FF)	0.09324	0.55070	7.18295
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.15329	0.59973	7.34531
	B->Y (FF)	0.13641	0.59410	7.34756
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.24365	0.70045	7.52234
	B->Y (FF)	0.22679	0.70101	7.50458
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.10334	0.64895	6.94040
	B->Y (FF)	0.08659	0.63605	7.05296

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00932	0.01014	0.05263
	B	0.00000	0.00000	0.00000
	B	0.00666	0.00885	0.06906
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01626	0.01749	0.06147
	B	0.00000	0.00000	0.00000
	B	0.01348	0.01600	0.07496
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03136	0.03332	0.07616
	B	0.00000	0.00000	0.00000
	B	0.02849	0.03184	0.08678
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.06407	0.06562	0.10900
	B	0.00000	0.00000	0.00000
	B	0.06120	0.06495	0.11897
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00688	0.00740	0.03871
	B	0.00000	0.00000	0.00000
	B	0.00513	0.00666	0.04857

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.02011	0.02118	0.06578
	B	0.00000	0.00000	0.00000
	B	0.01642	0.02097	0.10202
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.02501	0.02657	0.07074
	B	0.00000	0.00000	0.00000
	B	0.02128	0.02590	0.10480
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03893	0.03906	0.08242
	B	0.00000	0.00000	0.00000
	B	0.03541	0.03842	0.11336
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.07517	0.06447	0.10588
	B	0.00000	0.00000	0.00000
	B	0.07133	0.06361	0.13468
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01527	0.01590	0.04623
	B	0.00000	0.00000	0.00000
	B	0.01272	0.01547	0.06893

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00485	-0.00584	-0.00582
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00485	-0.00584	-0.00582
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00485	-0.00584	-0.00582
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00484	-0.00584	-0.00582
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00350	-0.00413	-0.00413

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00578	0.00588	0.00583
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00578	0.00588	0.00583
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00578	0.00588	0.00583
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00578	0.00589	0.00583
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00410	0.00413	0.00413

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00266	-0.00269	-0.00267
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00266	-0.00269	-0.00267
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00266	-0.00269	-0.00267
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00266	-0.00269	-0.00267
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00201	-0.00203	-0.00202

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00281	0.00281	0.00271
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00281	0.00282	0.00271
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00280	0.00282	0.00271
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00280	0.00281	0.00271
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00211	0.00212	0.00204

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__tbufi_1	12.45420
sky130_osu_sc_18T_ms__tbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tbufi_1	0.00584	0.00740	1.67339
sky130_osu_sc_18T_ms__tbufi_l	0.00453	0.00576	1.14359

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.18205	0.72489
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.11041	0.44023

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (FR)	0.03557	0.75526	10.19060
	OE->Y (FR)	0.04409	0.38312	5.24831
	OE->Y (RR)	0.06890	0.59825	6.65445
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.04246	0.84366	10.30660
	OE->Y (FR)	0.04715	0.38289	5.24808
	OE->Y (RR)	0.07591	0.68541	6.66453

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (RF)	0.02916	0.60139	8.09785
	OE->Y (FF)	0.04466	0.38310	5.24829
	OE->Y (RF)	0.02787	0.57057	7.64129
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.03334	0.64951	7.98313
	OE->Y (FF)	0.04770	0.38289	5.24807
	OE->Y (RF)	0.03249	0.61965	7.50523

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00868	0.01024	0.02796
	OE	0.00000	0.00000	0.00000
	OE	0.00887	0.01177	0.09396
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00665	0.00737	0.01869
	OE	0.00000	0.00000	0.00000
	OE	0.00633	0.00829	0.06456

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00166	-0.00117	0.00562
	OE	0.00000	0.00000	0.00000
	OE	0.00574	0.00896	0.10602
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00111	-0.00080	0.00452
	OE	0.00000	0.00000	0.00000
	OE	0.00402	0.00610	0.07003

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00443	-0.00451	-0.00445
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00383	-0.00391	-0.00385
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00339	-0.00342	-0.00340
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00300	-0.00306	-0.00301

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00443	0.00451	0.00445
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00392	0.00395	0.00389
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00339	0.00342	0.00340
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00306	0.00308	0.00303

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00344	0.00693	0.10599
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00306	0.00707	0.10552
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00236	0.00461	0.06994
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00208	0.00471	0.06962

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01013	0.01496	0.11432
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01005	0.01511	0.11445
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00796	0.01084	0.07637
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00794	0.01095	0.07647

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__tnbufi_1	12.45420
sky130_osu_sc_18T_ms__tnbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tnbufi_1	0.00584	0.00919	1.67449
sky130_osu_sc_18T_ms__tnbufi_l	0.00453	0.00688	1.14354

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.30263	0.36316
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.18369	0.22040

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (FR)	0.03570	0.75544	10.19490
	OE->Y (RR)	0.02794	0.38429	5.24939
	OE->Y (FR)	0.04723	0.75975	10.04320
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.04269	0.84359	10.30610
	OE->Y (RR)	0.02936	0.38456	5.24967
	OE->Y (FR)	0.05292	0.83789	9.99991

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (RF)	0.02879	0.60139	8.10085
	OE->Y (RF)	0.02769	0.38428	5.24941
	OE->Y (FF)	0.04849	0.48412	5.47346
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.03289	0.64932	7.98277
	OE->Y (RF)	0.02915	0.38454	5.24971
	OE->Y (FF)	0.05521	0.54371	5.39772

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00888	0.01043	0.02814
	OE	0.00000	0.00000	0.00000
	OE	0.02211	0.02815	0.12785
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00686	0.00757	0.01889
	OE	0.00000	0.00000	0.00000
	OE	0.01646	0.02013	0.08598

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00194	-0.00143	0.00536
	OE	0.00000	0.00000	0.00000
	OE	0.01931	0.02537	0.11316
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00138	-0.00106	0.00426
	OE	0.00000	0.00000	0.00000
	OE	0.01439	0.01808	0.07395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00381	-0.00388	-0.00383
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00327	-0.00334	-0.00328
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00281	-0.00283	-0.00282
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00245	-0.00250	-0.00246

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00381	0.00388	0.00383
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00335	0.00337	0.00332
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00281	0.00283	0.00282
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00251	0.00252	0.00248

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00697	-0.00383	0.09638
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00703	-0.00372	0.09642
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00495	-0.00292	0.06318
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00497	-0.00284	0.06323

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01664	0.02337	0.12349
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01639	0.02333	0.12325
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01247	0.01656	0.08271
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01229	0.01647	0.08259

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__xnor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xnor2_l	0.01155	0.01059	1.76771

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.60753	1.08804

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (RR)	B	0.08696	0.64456	7.05336
	A->Y (FR)	!B	0.04630	0.77869	10.48270
	B->Y (RR)	A	0.06936	0.62714	7.12709
	B->Y (FR)	!A	0.06559	0.78958	10.37420

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (FF)	B	0.08661	0.57893	6.15056
	A->Y (RF)	!B	0.04257	0.61167	8.17718
	B->Y (FF)	A	0.07479	0.56906	6.16096
	B->Y (RF)	!A	0.05431	0.62572	8.17402

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00872	0.01103	0.09252
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02138	0.02715	0.13951
	B	A	0.00000	0.00000	0.00000
	B	A	0.00245	0.00578	0.10433
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02395	0.02897	0.13120

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02670	0.03042	0.12604
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00550	0.00829	0.10744
	B	A	0.00000	0.00000	0.00000
	B	A	0.02418	0.02954	0.12841
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00736	0.00996	0.10823

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
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_18T_ms__xor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xor2_l	0.01155	0.01064	1.74407

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.60753	0.97484

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (RR)	!B	0.08297	0.63055	7.05083
	A->Y (FR)	B	0.05849	0.78405	10.38860
	B->Y (RR)	!A	0.07173	0.62702	7.07829
	B->Y (FR)	A	0.06377	0.78808	10.36060

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (FF)	!B	0.07360	0.55271	5.77899
	A->Y (RF)	B	0.04148	0.62840	8.29657
	B->Y (FF)	!A	0.06907	0.54991	5.89871
	B->Y (RF)	A	0.05062	0.60505	7.86732

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02527	0.03078	0.13788
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00413	0.00562	0.10222
	B	A	0.00000	0.00000	0.00000
	B	A	0.02615	0.03160	0.13668
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00208	0.00522	0.10475

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00468	0.00729	0.11113
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02714	0.03257	0.11953
	B	A	0.00000	0.00000	0.00000
	B	A	0.00475	0.00731	0.10803
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02457	0.03037	0.13016

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__ant	6.59340
sky130_osu_sc_18T_ms__tiehi	6.59340
sky130_osu_sc_18T_ms__tielo	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_18T_ms__ant	1.03231
sky130_osu_sc_18T_ms__tiehi	0.00000
sky130_osu_sc_18T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__ant	0.00000	485132.00000	970265.00000
sky130_osu_sc_18T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_18T_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_18T_ms__ant	0.00000	0.00000	0.00000
	-0.00178	0.14056	1.87599

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__ant	0.00000	0.00000	0.00000
	8.44085	8.00374	2.24458