sky130_osu_sc_18T_ms_ss_1P28_-40C.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_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.01903	0.01916	0.01490	0.51422	0.19056	0.50659
sky130_osu_sc_18T_ms__addf_l	0.01903	0.01915	0.01493	0.30799	0.19171	0.30716

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.00026	0.00027
sky130_osu_sc_18T_ms__addf_l	0.00000	0.00025	0.00027

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)	0.43993	2.74344	21.37030
	B->CO (RR)	0.41619	2.65060	20.79740
	CI->CO (RR)	0.42292	2.73511	21.50740
	CON->CO (FR)	0.10879	1.44162	13.24690
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.46787	2.65141	17.79380
	B->CO (RR)	0.44496	2.58041	17.48560
	CI->CO (RR)	0.45093	2.64332	17.96590
	CON->CO (FR)	0.14857	1.65298	13.38730

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)	1.22413	5.89735	42.61640
	B->CO (FF)	1.14581	5.73016	41.81770
	CI->CO (FF)	1.11792	5.70284	41.80870
	CON->CO (RF)	0.05076	0.81765	8.11311
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	1.20752	4.96046	30.01260
	B->CO (FF)	1.12884	4.81956	29.51240
	CI->CO (FF)	1.10065	4.76503	29.20870
	CON->CO (RF)	0.05772	0.84228	7.86609

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)	0.81349	2.52729	14.21850
	B->CON (FR)	0.74766	2.42727	13.99460
	CI->CON (FR)	0.70705	2.33404	13.45040
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.77395	2.49173	14.21940
	B->CON (FR)	0.70978	2.39254	14.00500
	CI->CON (FR)	0.66785	2.29890	13.44990

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)	0.19615	0.93042	6.95668
	B->CON (RF)	0.17988	0.90178	6.94287
	CI->CON (RF)	0.17913	0.92409	7.11281
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.18819	0.92361	6.95874
	B->CON (RF)	0.17261	0.89559	6.94498
	CI->CON (RF)	0.17115	0.91721	7.11502

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)	1.61045	6.22949	39.67640
	B->S (-R)	1.55106	6.11694	39.21980
	CI->S (-R)	1.49687	6.02177	38.82660
	CON->S (RR)	0.26526	1.53317	10.62270
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	1.55399	5.47187	30.20530
	B->S (-R)	1.49678	5.36977	29.92370
	CI->S (-R)	1.43985	5.26370	29.38440
	CON->S (RR)	0.29365	1.72205	10.60140

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)	0.96293	2.80058	16.52670
	B->S (-F)	1.04949	2.76720	16.08120
	CI->S (-F)	0.94448	2.78352	16.64450
	CON->S (FF)	0.47771	1.37665	8.87662
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.90783	2.48286	13.10610
	B->S (-F)	0.99368	2.45623	12.85260
	CI->S (-F)	0.88908	2.46326	13.25700
	CON->S (FF)	0.45356	1.36266	8.53654

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	0.00233	0.00229	0.00221
	B	0.00272	0.00277	0.00273
	CI	0.00294	0.00299	0.00294
sky130_osu_sc_18T_ms__addf_l	A	0.00182	0.00174	0.00165
	B	0.00221	0.00222	0.00213
	CI	0.00243	0.00244	0.00239

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00854	0.00853	0.00848
	B	0.00838	0.00844	0.00840
	CI	0.00733	0.00752	0.00748
sky130_osu_sc_18T_ms__addf_l	A	0.00803	0.00800	0.00795
	B	0.00787	0.00791	0.00784
	CI	0.00681	0.00697	0.00692

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00853	0.00852	0.00846
	B	0.00837	0.00842	0.00833
	CI	0.00732	0.00744	0.00742
sky130_osu_sc_18T_ms__addf_l	A	0.00803	0.00800	0.00794
	B	0.00787	0.00790	0.00784
	CI	0.00681	0.00692	0.00690

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00230	0.00228	0.00213
	B	0.00269	0.00274	0.00254
	CI	0.00293	0.00299	0.00290
sky130_osu_sc_18T_ms__addf_l	A	0.00179	0.00174	0.00154
	B	0.00218	0.00220	0.00198
	CI	0.00242	0.00244	0.00233

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00854	0.00853	0.00850
	B	0.00839	0.00845	0.00839
	CI	0.00733	0.00753	0.00746
sky130_osu_sc_18T_ms__addf_l	A	0.00803	0.00801	0.00797
	B	0.00788	0.00792	0.00785
	CI	0.00682	0.00698	0.00693

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01771	0.01780	0.01769
	B	0.01623	0.01608	0.01585
	CI	0.01417	0.01422	0.01416
sky130_osu_sc_18T_ms__addf_l	A	0.01700	0.01699	0.01689
	B	0.01554	0.01529	0.01505
	CI	0.01348	0.01346	0.01337

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00951	0.01025	0.51011	0.20046	0.51361
sky130_osu_sc_18T_ms__addh_l	0.00951	0.01025	0.31018	0.20230	0.31309

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.00021	0.00024
sky130_osu_sc_18T_ms__addh_l	0.00000	0.00020	0.00023

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)	0.32562	1.57074	10.57320
	B->CO (RR)	0.33260	1.57156	10.75160
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.33201	1.70845	10.33860
	B->CO (RR)	0.33904	1.71029	10.54450

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)	0.38127	1.25071	8.80812
	B->CO (FF)	0.40017	1.26859	8.85690
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.37141	1.28958	8.78117
	B->CO (FF)	0.39036	1.30964	8.82769

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	0.45804	1.34621	6.66406
	A->CON (FR)	!B	0.50900	2.14411	13.40520
	B->CON (RR)	A	0.46557	1.34721	6.84899
	B->CON (FR)	!A	0.58657	2.30168	14.17350
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.41073	1.29682	6.53750
	A->CON (FR)	!B	0.45590	2.09716	13.41440
	B->CON (RR)	A	0.41826	1.29850	6.73530
	B->CON (FR)	!A	0.53347	2.25379	14.18690

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	0.49111	1.33151	8.22257
	A->CON (RF)	!B	0.12703	0.86978	7.08282
	B->CON (FF)	A	0.50873	1.36305	8.35946
	B->CON (RF)	!A	0.13948	0.87052	6.98990
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.43584	1.27266	8.06339
	A->CON (RF)	!B	0.11628	0.86017	7.08723
	B->CON (FF)	A	0.45282	1.30704	8.20524
	B->CON (RF)	!A	0.12907	0.86137	6.99403

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	0.33788	2.59029	21.08620
	A->S (FR)	B	0.70517	3.03209	21.91240
	B->S (RR)	!A	0.34771	2.54868	20.55800
	B->S (FR)	A	0.72658	3.11532	22.50520
	CON->S (FR)	-	0.11460	1.46319	13.39300
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.33962	2.45592	17.55580
	A->S (FR)	B	0.66363	2.86596	18.32970
	B->S (RR)	!A	0.35095	2.43342	17.25380
	B->S (FR)	A	0.68348	2.93269	18.70510
	CON->S (FR)	-	0.14110	1.63220	13.28600

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	0.84317	5.26636	40.45170
	A->S (RF)	B	0.65172	2.93864	19.93940
	B->S (FF)	!A	0.92040	5.42592	41.26090
	B->S (RF)	A	0.65908	2.93820	20.12380
	CON->S (RF)	-	0.04804	0.80229	8.02230
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.79950	4.44657	29.18940
	A->S (RF)	B	0.61119	2.58607	14.93680
	B->S (FF)	!A	0.87585	4.60504	29.97440
	B->S (RF)	A	0.61869	2.58786	15.13450
	CON->S (RF)	-	0.05846	0.88190	8.21698

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	0.00382	0.00373	0.00359
	B	0.00000	0.00000	0.00000
	B	0.00360	0.00352	0.00339
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00309	0.00295	0.00283
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00274	0.00263

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	0.00607	0.00597	0.00563
	B	0.00000	0.00000	0.00000
	B	0.00632	0.00631	0.00601
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00534	0.00521	0.00501
	B	0.00000	0.00000	0.00000
	B	0.00559	0.00557	0.00539

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	0.00381	0.00371	0.00359
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00529	0.00524	0.00522
	B	A	0.00000	0.00000	0.00000
	B	A	0.00360	0.00350	0.00335
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00565	0.00560	0.00557
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00309	0.00295	0.00283
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00480	0.00474	0.00471
	B	A	0.00000	0.00000	0.00000
	B	A	0.00287	0.00274	0.00260
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00515	0.00509	0.00506

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	0.00607	0.00598	0.00585
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00095	0.00095	0.00090
	B	A	0.00000	0.00000	0.00000
	B	A	0.00632	0.00631	0.00623
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00148	0.00143	0.00120
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00534	0.00522	0.00504
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00034	0.00034	0.00025
	B	A	0.00000	0.00000	0.00000
	B	A	0.00559	0.00557	0.00543
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00087	0.00081	0.00061

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	0.00609	0.00598	0.00587
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00095	0.00098	0.00095
	B	A	0.00000	0.00000	0.00000
	B	A	0.00632	0.00632	0.00625
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00150	0.00146	0.00142
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00536	0.00522	0.00514
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00034	0.00034	0.00030
	B	A	0.00000	0.00000	0.00000
	B	A	0.00559	0.00557	0.00552
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00089	0.00084	0.00079

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	0.00382	0.00372	0.00359
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00529	0.00529	0.00528
	B	A	0.00000	0.00000	0.00000
	B	A	0.00360	0.00350	0.00339
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00564	0.00563	0.00563
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00309	0.00295	0.00284
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00480	0.00478	0.00474
	B	A	0.00000	0.00000	0.00000
	B	A	0.00287	0.00273	0.00262
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00515	0.00510	0.00510

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00508	0.00514	0.51292
sky130_osu_sc_18T_ms__and2_2	0.00508	0.00514	1.01870
sky130_osu_sc_18T_ms__and2_4	0.00508	0.00514	1.98564
sky130_osu_sc_18T_ms__and2_6	0.00511	0.00514	2.88170
sky130_osu_sc_18T_ms__and2_8	0.00508	0.00514	3.79735
sky130_osu_sc_18T_ms__and2_l	0.00394	0.00400	0.30616

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.00009	0.00012
sky130_osu_sc_18T_ms__and2_2	0.00000	0.00013	0.00015
sky130_osu_sc_18T_ms__and2_4	0.00000	0.00021	0.00022
sky130_osu_sc_18T_ms__and2_6	0.00000	0.00029	0.00030
sky130_osu_sc_18T_ms__and2_8	0.00000	0.00037	0.00039
sky130_osu_sc_18T_ms__and2_l	0.00000	0.00008	0.00010

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)	0.24899	1.46554	10.13620
	B->Y (RR)	0.25909	1.47483	10.37170
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.28243	1.35146	10.50110
	B->Y (RR)	0.29246	1.35444	10.69090
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.39543	1.36108	11.06100
	B->Y (RR)	0.40536	1.36396	11.19320
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.50838	1.42956	11.34310
	B->Y (RR)	0.51822	1.43377	11.43750
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.62002	1.52839	11.76140
	B->Y (RR)	0.63001	1.53454	11.80940
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.31377	1.70809	10.41070
	B->Y (RR)	0.32507	1.71622	10.68140

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)	0.27536	1.11856	8.34134
	B->Y (FF)	0.29495	1.13593	8.41027
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.34965	1.15903	8.66974
	B->Y (FF)	0.37048	1.18125	8.72999
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.52025	1.32850	9.19500
	B->Y (FF)	0.54180	1.35204	9.24098
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.69220	1.51371	9.53429
	B->Y (FF)	0.71413	1.53723	9.57481
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.85690	1.69402	9.82425
	B->Y (FF)	0.87917	1.72008	9.86363
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.34239	1.21305	8.37128
	B->Y (FF)	0.36923	1.23960	8.45070

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	0.00320	0.00301	0.00285
	B	0.00000	0.00000	0.00000
	B	0.00325	0.00306	0.00291
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00612	0.00610	0.00603
	B	0.00000	0.00000	0.00000
	B	0.00617	0.00615	0.00607
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01252	0.01273	0.01285
	B	0.00000	0.00000	0.00000
	B	0.01255	0.01280	0.01286
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01885	0.01945	0.01956
	B	0.00000	0.00000	0.00000
	B	0.01892	0.01948	0.01963
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02518	0.02606	0.02655
	B	0.00000	0.00000	0.00000
	B	0.02523	0.02608	0.02663
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00236	0.00223	0.00211
	B	0.00000	0.00000	0.00000
	B	0.00241	0.00227	0.00217

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	0.00746	0.00731	0.00717
	B	0.00000	0.00000	0.00000
	B	0.00830	0.00814	0.00804
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00946	0.00958	0.00945
	B	0.00000	0.00000	0.00000
	B	0.01030	0.01042	0.01030
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01436	0.01506	0.01502
	B	0.00000	0.00000	0.00000
	B	0.01520	0.01587	0.01583
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01931	0.02058	0.02066
	B	0.00000	0.00000	0.00000
	B	0.02015	0.02134	0.02145
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02409	0.02582	0.02617
	B	0.00000	0.00000	0.00000
	B	0.02493	0.02657	0.02690
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00576	0.00562	0.00551
	B	0.00000	0.00000	0.00000
	B	0.00636	0.00624	0.00613

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)	-0.00262	-0.00264	-0.00264
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00262	-0.00264	-0.00264
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00262	-0.00263	-0.00264
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00264	-0.00265	-0.00266
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00262	-0.00263	-0.00264
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00194	-0.00196	-0.00196

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)	0.00264	0.00269	0.00265
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00264	0.00268	0.00265
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00264	0.00268	0.00265
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00265	0.00269	0.00266
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00264	0.00268	0.00265
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00195	0.00196	0.00196

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)	-0.00247	-0.00248	-0.00248
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00247	-0.00248	-0.00248
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00247	-0.00248	-0.00248
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00247	-0.00248	-0.00248
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00247	-0.00248	-0.00248
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00183	-0.00184	-0.00184

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00250	0.00249
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00248	0.00249
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00248	0.00249
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00248	0.00249
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00248	0.00249
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00183	0.00185	0.00184

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00469	0.00495	0.00483	0.20302

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.00006	0.00008

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)	0.42793	2.19498	14.27700
	A1->Y (FR)	0.37044	2.10110	14.08510
	B0->Y (FR)	0.33642	2.02154	13.53880

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)	0.09822	0.82643	6.87869
	A1->Y (RF)	0.08901	0.81666	6.95412
	B0->Y (RF)	0.06598	0.78344	7.04433

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	0.00581	0.00573	0.00529
	A1	0.00000	0.00000	0.00000
	A1	0.00496	0.00484	0.00481
	B0	0.00495	0.00484	0.00481

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	0.00077	0.00065	0.00053
	A1	0.00000	0.00000	0.00000
	A1	0.00078	0.00066	0.00053
	B0	-0.00056	-0.00056	-0.00063

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)	-0.00223	-0.00228	-0.00226
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00232	-0.00234	-0.00233
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00232	-0.00234	-0.00233

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)	0.00224	0.00228	0.00226
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00233	0.00234	0.00234
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00233	0.00235	0.00234

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)	-0.00220	-0.00226	-0.00223
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00229	-0.00232	-0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00249	-0.00251	-0.00252

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)	0.00222	0.00226	0.00223
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00229	0.00232	0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00251	0.00257	0.00252

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)	-0.00150	-0.00153	-0.00151

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)	0.00165	0.00164	0.00155

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00470	0.00495	0.00518	0.00491	0.19623

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.00008	0.00010

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)	0.54524	2.30573	14.27160
	A1->Y (FR)	0.48930	2.22673	14.09600
	B0->Y (FR)	0.36018	2.01360	13.31860
	B1->Y (FR)	0.41624	2.09213	13.46680

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)	0.11912	0.84424	6.84427
	A1->Y (RF)	0.10988	0.83537	6.91801
	B0->Y (RF)	0.08082	0.80203	6.86138
	B1->Y (RF)	0.08955	0.80595	6.79261

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	0.00713	0.00704	0.00695
	A1	0.00629	0.00615	0.00572
	B0	0.00533	0.00516	0.00511
	B1	0.00615	0.00601	0.00597

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00182	0.00173	0.00156
	A1	0.00184	0.00173	0.00156
	B0	-0.00030	-0.00030	-0.00037
	B1	-0.00030	-0.00029	-0.00036

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)	-0.00223	-0.00228	-0.00226
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00232	-0.00234	-0.00233
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00232	-0.00234	-0.00233
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00232	-0.00234	-0.00233

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)	0.00224	0.00230	0.00226
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00233	0.00234	0.00234
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00232	0.00235	0.00234
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00232	0.00235	0.00234

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)	-0.00220	-0.00223	-0.00223
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00229	-0.00231	-0.00230
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00249	-0.00251	-0.00251
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00249	-0.00251	-0.00251

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)	0.00222	0.00223	0.00223
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00229	0.00232	0.00231
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00251	0.00255	0.00252
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00251	0.00257	0.00252

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)	-0.00151	-0.00154	-0.00151
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00150	-0.00152	-0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00256	-0.00257	-0.00258
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00256	-0.00257	-0.00258

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)	0.00165	0.00165	0.00155
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00150	0.00153	0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00258	0.00259	0.00259
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00258	0.00259	0.00259

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)	-0.00151	-0.00154	-0.00152
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00151	-0.00152	-0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00236	-0.00237	-0.00237
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00236	-0.00237	-0.00237

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)	0.00166	0.00167	0.00155
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00151	0.00152	0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00236	0.00238	0.00237
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00236	0.00238	0.00237

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00518	0.50006
sky130_osu_sc_18T_ms__buf_2	0.00518	1.01916
sky130_osu_sc_18T_ms__buf_4	0.00517	1.99529
sky130_osu_sc_18T_ms__buf_6	0.00097	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00518	3.88764
sky130_osu_sc_18T_ms__buf_l	0.00408	0.30494

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.00007	0.00007
sky130_osu_sc_18T_ms__buf_2	0.00000	0.00011	0.00012
sky130_osu_sc_18T_ms__buf_4	0.00000	0.00019	0.00020
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.00034	0.00037
sky130_osu_sc_18T_ms__buf_l	0.00000	0.00007	0.00007

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)**	0.18310	1.38723	9.85267
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.19121	1.26094	10.33150
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.25683	1.22680	10.84080
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.39038	1.28991	11.50250
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.23423	1.62707	10.26300

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)**	0.26108	1.09737	8.22219
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.33700	1.14456	8.63235
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.50876	1.30953	9.17191
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.84708	1.68536	9.86097
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.32975	1.19564	8.30803

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	0.00300	0.00274	0.00257
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00593	0.00583	0.00567
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01236	0.01254	0.01250
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02506	0.02574	0.02596
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00229	0.00210	0.00196

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	0.00730	0.00710	0.00702
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00926	0.00933	0.00924
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01418	0.01481	0.01479
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02394	0.02559	0.02590
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00568	0.00552	0.00542

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
	-0.00039	-0.00039	-0.00039

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
	0.00039	0.00039	0.00039

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00484	0.00492	0.01509	0.50671	0.50483
sky130_osu_sc_18T_ms__dffr_l	0.00484	0.00492	0.01509	0.30168	0.30724

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.00041	0.00046
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.00040	0.00046

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)	1.77787	3.65589	16.40270
	QN->Q (FR)	0.11945	1.52284	13.87370
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	1.74777	3.76724	15.57220
	QN->Q (FR)	0.15494	1.69346	13.63240

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)	1.33515	3.62065	20.43320
	QN->Q (RF)	0.05847	0.89256	8.75134
	RN->Q (FF)	0.87748	3.28533	22.56200
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	1.42500	4.01286	19.90700
	QN->Q (RF)	0.06351	0.89421	8.28528
	RN->Q (FF)	0.97003	3.67775	22.01920

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)	1.16887	2.40351	11.25670
	RN->QN (FR)	0.70866	2.06718	13.38710
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	1.20704	2.60240	11.32250
	RN->QN (FR)	0.74920	2.26763	13.44600

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)**	1.54336	2.39818	7.25879
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	1.47731	2.31516	6.85226

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)	-0.18218	-0.21306	-1.18207
	setup	CK (R)	1.42464	1.40849	2.11452
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.18600	-0.21506	-1.18483
	setup	CK (R)	1.42587	1.41317	2.12223

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)	-0.67612	-1.19242	-12.43450
	setup	CK (R)	0.78022	1.27114	12.58820
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.67782	-1.19474	-12.43100
	setup	CK (R)	0.77661	1.27093	12.58790

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)	-0.18218	-0.21306	-1.18207
	setup	CK (R)	1.42464	1.40849	2.11452
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.18600	-0.21506	-1.18483
	setup	CK (R)	1.42587	1.41317	2.12223

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)	-0.67612	-1.19242	-12.43450
	setup	CK (R)	0.78022	1.27114	12.58820
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.67782	-1.19474	-12.43100
	setup	CK (R)	0.77661	1.27093	12.58790

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)	1.31292	1.30641	1.77984
	removal	CK (R)	-0.18661	-0.21750	-0.15319
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	1.31291	1.30542	1.78581
	removal	CK (R)	-0.18661	-0.21750	-0.15319

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)	1.31292	1.30641	1.77984
	removal	CK (R)	-0.18661	-0.21750	-0.15319
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	1.31291	1.30542	1.78581
	removal	CK (R)	-0.18661	-0.21750	-0.15319

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 ()	0.55197	0.99680	13.33370
	min_pulse_width	RN ()	0.55197	0.99680	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.56351	0.99043	13.33370
	min_pulse_width	RN ()	0.55977	0.99043	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 ()	0.87764	0.96919	13.33370
	min_pulse_width	CK ()	0.78968	0.72709	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.79184	0.89274	13.33370
	min_pulse_width	CK ()	0.76876	0.71647	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 ()	1.75398	1.79532	13.33370
	min_pulse_width	CK ()	0.65108	1.08175	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	1.75606	1.79744	13.33370
	min_pulse_width	CK ()	0.64698	1.08175	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	0.00712	0.00669	0.00347
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00631	0.00595	0.00449

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	0.00800	0.00779	0.00702
	RN	-0.00107	-0.02523	-0.20755
	RN	0.01788	0.01776	0.01680
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00716	0.00696	0.00656
	RN	-0.00107	-0.01848	-0.12357
	RN	0.01703	0.01693	0.01633

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	0.00800	0.00779	0.00702
	RN	-0.00107	-0.02517	-0.20678
	RN	0.01788	0.01777	0.01681
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00716	0.00697	0.00656
	RN	-0.00107	-0.01869	-0.12584
	RN	0.01704	0.01693	0.01636

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	0.00709	0.00666	0.00329
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00627	0.00591	0.00414

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	-0.00220	-0.00226	-0.00225
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00781	0.00763	0.00738
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00342	0.00325	0.00302
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00220	-0.00226	-0.00225
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00781	0.00763	0.00738
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00342	0.00325	0.00302

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	0.00223	0.00226	0.00225
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01337	0.01322	0.01301
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00618	0.00604	0.00599
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00223	0.00226	0.00225
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01337	0.01322	0.01301
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00618	0.00604	0.00599

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)	0.00296	0.00274	0.00255
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00772	0.00738	0.00706
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)	0.00297	0.00274	0.00255
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00772	0.00738	0.00706

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)	0.00647	0.00625	0.00619
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01364	0.01338	0.01311
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)	0.00647	0.00625	0.00619
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01364	0.01338	0.01311

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)	-0.00040	-0.00066	-0.00090
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00380	0.00336	0.00280
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00064	-0.00093	-0.00118
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00040	-0.00066	-0.00090
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00382	0.00336	0.00280
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00064	-0.00093	-0.00118

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)	0.01090	0.01068	0.01046
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02142	0.02109	0.02039
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01646	0.01624	0.01583
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02173	0.02128	0.02083
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01159	0.01132	0.01121
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01090	0.01068	0.01046
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02142	0.02109	0.02039
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01646	0.01624	0.01583
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02173	0.02128	0.02083
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01159	0.01132	0.01121

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00480	0.00493	0.01044	0.01533	0.51517	0.51346
sky130_osu_sc_18T_ms__dffsr_l	0.00480	0.00493	0.01043	0.01533	0.30846	0.30757

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.00043	0.00050
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.00043	0.00050

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)	1.48723	3.30400	16.06060
	QN->Q (FR)	0.11505	1.49829	13.74050
	RN->Q (RR)	1.22586	3.06022	15.92390
	SN->Q (FR)	1.21962	3.16821	18.96900
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	1.51121	3.52850	15.67740
	QN->Q (FR)	0.15480	1.70481	13.76610
	RN->Q (RR)	1.25422	3.28616	15.55230
	SN->Q (FR)	1.24802	3.39522	18.57770

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)	1.44513	3.71696	20.47760
	QN->Q (RF)	0.05351	0.85679	8.48699
	RN->Q (FF)	0.92902	3.31209	22.59030
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	1.54964	4.17742	20.36700
	QN->Q (RF)	0.06333	0.89775	8.32881
	RN->Q (FF)	1.03548	3.77119	22.48180

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)	1.28059	2.51977	11.37750
	RN->QN (FR)	0.76646	2.11385	13.49920
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	1.32782	2.73417	11.46240
	RN->QN (FR)	0.81467	2.33001	13.57980

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)	1.29010	2.09751	7.01711
	RN->QN (RF)	1.02614	1.86120	6.88994
	SN->QN (FF)	1.02604	1.97646	9.92951
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	1.26717	2.07585	6.74241
	RN->QN (RF)	1.00452	1.84089	6.61434
	SN->QN (FF)	1.00476	1.95675	9.63748

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)	-0.19398	-0.22053	-1.27644
	setup	CK (R)	1.14613	1.12804	1.82002
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.19421	-0.22118	-1.27571
	setup	CK (R)	1.14206	1.12621	1.81835

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)	-0.75814	-1.26041	-12.62880
	setup	CK (R)	0.87362	1.32974	12.73290
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.75695	-1.26358	-12.62890
	setup	CK (R)	0.86647	1.32531	12.73240

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)	-0.19398	-0.22053	-1.27644
	setup	CK (R)	1.14613	1.12804	1.82002
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.19421	-0.22118	-1.27571
	setup	CK (R)	1.14206	1.12621	1.81835

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)	-0.75814	-1.26041	-12.62880
	setup	CK (R)	0.87362	1.32974	12.73290
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.75695	-1.26358	-12.62890
	setup	CK (R)	0.86647	1.32531	12.73240

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)	0.96395	0.95661	1.36966
	removal	CK (R)	-0.06382	-0.08111	-0.07735
	hold	SN (R)	-0.99238	-1.36870	-10.52750
	setup	SN (R)	1.03414	1.44921	11.36500
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.95949	0.95478	1.35472
	removal	CK (R)	-0.06402	-0.08111	-0.07735
	hold	SN (R)	-0.93057	-1.31089	-10.46630
	setup	SN (R)	1.02783	1.42244	11.31930

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)	0.96395	0.95661	1.36966
	removal	CK (R)	-0.06382	-0.08111	-0.07735
	hold	SN (R)	-1.00968	-1.37148	-10.52750
	hold	SN (R)	-0.99238	-1.36870	-10.53580
	setup	SN (R)	1.03414	1.44008	11.34570
	setup	SN (R)	1.01683	1.44921	11.36500
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.95949	0.95478	1.35472
	removal	CK (R)	-0.06402	-0.08111	-0.07735
	hold	SN (R)	-0.99971	-1.34583	-10.47010
	hold	SN (R)	-0.93057	-1.31089	-10.46630
	setup	SN (R)	1.02783	1.40312	11.27910
	setup	SN (R)	0.95866	1.42244	11.31930

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 ()	0.63517	1.04140	13.33370
	min_pulse_width	RN ()	0.63248	1.04352	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.67311	1.03290	13.33370
	min_pulse_width	RN ()	0.66529	1.03290	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)	0.09007	0.10969	0.79541
	removal	CK (R)	-0.01372	-0.05105	-0.58409
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.08420	0.10745	0.79196
	removal	CK (R)	-0.01372	-0.05105	-0.58605

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)	0.09007	0.10969	0.79541
	removal	CK (R)	-0.01372	-0.05105	-0.58409
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.08420	0.10745	0.79196
	removal	CK (R)	-0.01372	-0.05105	-0.58605

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 ()	1.02251	1.48525	13.57140
	min_pulse_width	SN ()	1.01402	1.48950	13.58440
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	1.01728	1.44915	13.48350
	min_pulse_width	SN ()	0.96048	1.46402	13.51930

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 ()	0.66185	0.77169	13.33370
	min_pulse_width	CK ()	0.81682	0.74620	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.61742	0.75257	13.33370
	min_pulse_width	CK ()	0.80222	0.73771	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 ()	1.48147	1.51923	13.33370
	min_pulse_width	CK ()	0.75254	1.14334	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	1.47733	1.51499	13.33370
	min_pulse_width	CK ()	0.74683	1.14121	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	0.00851	0.00817	0.00573
	RN	0.01601	0.01574	0.01330
	SN	-0.00107	-0.02548	-0.21101
	SN	0.01718	0.01693	0.01483
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00777	0.00741	0.00592
	RN	0.01527	0.01497	0.01353
	SN	-0.00107	-0.01873	-0.12635
	SN	0.01643	0.01616	0.01476

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	0.00896	0.00881	0.00816
	RN	-0.00107	-0.02548	-0.21101
	RN	0.01853	0.01841	0.01759
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00820	0.00806	0.00763
	RN	-0.00107	-0.01873	-0.12635
	RN	0.01776	0.01764	0.01705

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	0.00897	0.00883	0.00815
	RN	-0.00107	-0.02543	-0.21031
	RN	0.01853	0.01842	0.01760
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00821	0.00807	0.00765
	RN	-0.00107	-0.01870	-0.12598
	RN	0.01776	0.01765	0.01708

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	0.00846	0.00813	0.00561
	RN	0.01597	0.01569	0.01336
	SN	-0.00107	-0.02543	-0.21030
	SN	0.01714	0.01689	0.01461
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00772	0.00736	0.00557
	RN	0.01523	0.01492	0.01323
	SN	-0.00107	-0.01870	-0.12597
	SN	0.01639	0.01611	0.01453

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	-0.00220	-0.00227	-0.00225
	(!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)	0.00989	0.00972	0.00949
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00385	0.00369	0.00346
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00383	0.00367	0.00344
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00388	0.00372	0.00349
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00220	-0.00227	-0.00225
	(!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)	0.00989	0.00972	0.00949
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00385	0.00369	0.00346
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00383	0.00367	0.00344
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00388	0.00372	0.00349

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	0.00223	0.00227	0.00225
	(!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)	0.01494	0.01481	0.01444
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00659	0.00647	0.00642
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00663	0.00650	0.00643
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00657	0.00644	0.00639
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00223	0.00227	0.00225
	(!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)	0.01494	0.01481	0.01443
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00659	0.00646	0.00641
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00662	0.00649	0.00642
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00656	0.00643	0.00638

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)	0.00310	0.00288	0.00257
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00946	0.00913	0.00868
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)	0.00310	0.00288	0.00257
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00947	0.00913	0.00869

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)	0.00706	0.00683	0.00676
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01449	0.01420	0.01388
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)	0.00705	0.00683	0.00676
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01448	0.01419	0.01388

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)	-0.00520	-0.00523	-0.00524
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00534	-0.00541	-0.00537
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00513	-0.00517	-0.00517
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00287	0.00272	0.00237
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)	-0.00520	-0.00523	-0.00524
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00533	-0.00540	-0.00536
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00513	-0.00516	-0.00517
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00287	0.00272	0.00237

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)	0.00523	0.00536	0.00526
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00534	0.00542	0.00537
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00515	0.00520	0.00517
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01059	0.01039	0.01036
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)	0.00523	0.00536	0.00526
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00533	0.00541	0.00536
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00515	0.00520	0.00517
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01059	0.01038	0.01036

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)	-0.00041	-0.00067	-0.00090
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00438	0.00397	0.00342
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00432	0.00393	0.00337
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00051	-0.00080	-0.00105
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00355	0.00309	0.00261
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00041	-0.00067	-0.00090
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00437	0.00397	0.00342
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00432	0.00392	0.00337
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00051	-0.00080	-0.00105
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00355	0.00309	0.00261

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)	0.02360	0.02330	0.02257
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01093	0.01070	0.01049
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01672	0.01653	0.01612
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01677	0.01660	0.01615
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02329	0.02281	0.02220
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01148	0.01122	0.01111
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01409	0.01360	0.01334
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02360	0.02330	0.02257
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01093	0.01070	0.01049
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01672	0.01651	0.01612
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01677	0.01659	0.01615
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02328	0.02281	0.02219
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01148	0.01122	0.01111
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01408	0.01359	0.01334

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00482	0.00848	0.01504	0.50138	0.50863
sky130_osu_sc_18T_ms__dffs_l	0.00482	0.00849	0.01503	0.30841	0.30521

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.00038	0.00042
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.00037	0.00042

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)	0.95809	2.74516	15.41920
	QN->Q (FR)	0.11922	1.51134	13.74670
	SN->Q (FR)	0.82761	2.74205	18.40180
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.97821	2.95536	14.99620
	QN->Q (FR)	0.15466	1.70250	13.74760
	SN->Q (FR)	0.84412	2.95251	17.96520

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)	1.45975	3.73048	20.35240
	QN->Q (RF)	0.05800	0.88615	8.70233
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	1.53865	4.15466	20.33210
	QN->Q (RF)	0.06310	0.89620	8.31943

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)	1.28714	2.52876	11.41020
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	1.31709	2.71025	11.37850

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)	0.77661	1.54426	6.43138
	SN->QN (FF)	0.63829	1.54852	9.42384
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.75577	1.51801	6.06012
	SN->QN (FF)	0.61550	1.52052	9.02883

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)	-0.13029	-0.17052	-1.08529
	setup	CK (R)	0.69111	0.67127	1.51450
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.13176	-0.17091	-1.08540
	setup	CK (R)	0.68648	0.66872	1.51553

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)	-0.69550	-1.20918	-12.50690
	setup	CK (R)	0.87614	1.29579	12.66130
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.69705	-1.20962	-12.50750
	setup	CK (R)	0.87449	1.29721	12.65980

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)	-0.13029	-0.17052	-1.08529
	setup	CK (R)	0.69111	0.67127	1.51450
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.13176	-0.17091	-1.08540
	setup	CK (R)	0.68648	0.66872	1.51553

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)	-0.69550	-1.20918	-12.50690
	setup	CK (R)	0.87614	1.29579	12.66130
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.69705	-1.20962	-12.50750
	setup	CK (R)	0.87449	1.29721	12.65980

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)	0.14875	0.16706	1.21548
	removal	CK (R)	-0.03601	-0.08317	-0.91514
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.14142	0.16650	1.21249
	removal	CK (R)	-0.03474	-0.08317	-0.91414

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)	0.14875	0.16706	1.21548
	removal	CK (R)	-0.03601	-0.08317	-0.91514
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.14142	0.16650	1.21249
	removal	CK (R)	-0.03474	-0.08317	-0.91414

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 ()	0.60197	1.22828	13.33370
	min_pulse_width	SN ()	0.61288	1.22191	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.59032	1.19431	13.33370
	min_pulse_width	SN ()	0.57610	1.20280	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 ()	0.31062	0.68674	13.33370
	min_pulse_width	CK ()	0.83138	0.75257	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.29187	0.68461	13.33370
	min_pulse_width	CK ()	0.80639	0.73771	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 ()	1.02241	1.07113	13.33370
	min_pulse_width	CK ()	0.75930	1.11148	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	1.01836	1.06901	13.33370
	min_pulse_width	CK ()	0.75508	1.11148	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	0.00711	0.00658	0.00302
	SN	-0.00107	-0.02507	-0.20536
	SN	0.01503	0.01467	0.01160
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00628	0.00586	0.00431
	SN	-0.00107	-0.01873	-0.12633
	SN	0.01419	0.01394	0.01243

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	0.00798	0.00781	0.00706
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00714	0.00698	0.00657

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	0.00798	0.00781	0.00706
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00715	0.00698	0.00658

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	0.00708	0.00655	0.00307
	SN	-0.00107	-0.02529	-0.20833
	SN	0.01499	0.01463	0.01126
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00625	0.00582	0.00411
	SN	-0.00107	-0.01861	-0.12501
	SN	0.01415	0.01390	0.01221

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	-0.00223	-0.00229	-0.00228
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00777	0.00757	0.00724
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00333	0.00316	0.00294
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00223	-0.00229	-0.00228
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00777	0.00757	0.00724
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00333	0.00316	0.00294

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	0.00226	0.00229	0.00228
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01327	0.01313	0.01299
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00630	0.00616	0.00611
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00226	0.00229	0.00228
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01327	0.01313	0.01299
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00630	0.00616	0.00611

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)	-0.00389	-0.00391	-0.00391
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00288	0.00274	0.00255
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)	-0.00389	-0.00391	-0.00391
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00288	0.00274	0.00255

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)	0.00390	0.00395	0.00392
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00772	0.00750	0.00739
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)	0.00390	0.00395	0.00392
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00772	0.00750	0.00739

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)	-0.00041	-0.00068	-0.00091
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00058	-0.00087	-0.00112
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00302	0.00257	0.00205
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00041	-0.00068	-0.00091
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00058	-0.00087	-0.00112
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00302	0.00257	0.00205

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)	0.02134	0.02101	0.02033
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01091	0.01068	0.01051
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02161	0.02108	0.02062
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01152	0.01127	0.01115
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01375	0.01327	0.01303
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02134	0.02101	0.02033
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01091	0.01068	0.01051
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02161	0.02108	0.02062
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01152	0.01127	0.01115
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01375	0.01327	0.01303

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00499	0.01498	0.51104	0.51484
sky130_osu_sc_18T_ms__dff_l	0.00499	0.01497	0.30162	0.30393

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.00035	0.00036
sky130_osu_sc_18T_ms__dff_l	0.00000	0.00035	0.00036

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)	0.75019	2.49389	15.11170
	QN->Q (FR)	0.11435	1.48772	13.65570
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.79938	2.74810	14.67400
	QN->Q (FR)	0.15643	1.70655	13.69050

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)	1.28372	3.53322	20.14420
	QN->Q (RF)	0.05328	0.85176	8.45493
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	1.39694	3.99446	19.91580
	QN->Q (RF)	0.06320	0.89114	8.27102

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)	1.12410	2.35428	11.20610
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	1.17754	2.57485	11.25120

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)	0.58936	1.31999	6.18315
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.58779	1.32937	5.92366

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)	-0.13295	-0.17179	-1.13641
	setup	CK (R)	0.48738	0.46431	1.46410
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.13318	-0.17179	-1.13635
	setup	CK (R)	0.48335	0.46227	1.45966

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)	-0.66128	-1.20212	-12.48960
	setup	CK (R)	0.78775	1.30273	12.70440
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.66174	-1.20124	-12.49070
	setup	CK (R)	0.78885	1.30425	12.70460

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 ()	0.25392	0.69311	13.33370
	min_pulse_width	CK ()	0.75829	0.71435	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.24805	0.69098	13.33370
	min_pulse_width	CK ()	0.74360	0.70798	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 ()**	0.81686	0.97981	13.33370
	min_pulse_width	**CK ()**	0.65297	1.11360	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.81510	0.97769	13.33370
	min_pulse_width	**CK ()**	0.65085	1.11360	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	0.00750	0.00702	0.00414
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00674	0.00628	0.00481

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	0.00816	0.00799	0.00735
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00742	0.00725	0.00682

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	0.00816	0.00800	0.00734
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00742	0.00725	0.00682

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	0.00746	0.00699	0.00459
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00671	0.00624	0.00453

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	-0.00219	-0.00226	-0.00224
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00747	0.00730	0.00700
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00219	-0.00226	-0.00224
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00747	0.00730	0.00700

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	0.00223	0.00226	0.00224
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01385	0.01368	0.01349
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00223	0.00226	0.00224
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01385	0.01368	0.01349

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)	-0.00042	-0.00067	-0.00091
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00057	-0.00086	-0.00111
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00042	-0.00067	-0.00091
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00057	-0.00086	-0.00111

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)	0.01087	0.01064	0.01047
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02104	0.02073	0.02006
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02205	0.02152	0.02103
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01147	0.01121	0.01109
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01087	0.01064	0.01047
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02104	0.02073	0.02006
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02206	0.02152	0.02103
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01147	0.01121	0.01109

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00497	0.50532
sky130_osu_sc_18T_ms__inv_10	0.04665	4.75359
sky130_osu_sc_18T_ms__inv_2	0.00952	1.01392
sky130_osu_sc_18T_ms__inv_3	0.01419	1.46557
sky130_osu_sc_18T_ms__inv_4	0.01878	1.97302
sky130_osu_sc_18T_ms__inv_6	0.02816	2.92166
sky130_osu_sc_18T_ms__inv_8	0.03741	3.85077
sky130_osu_sc_18T_ms__inv_l	0.00383	0.30126

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.00004	0.00004
sky130_osu_sc_18T_ms__inv_10	0.00000	0.00037	0.00042
sky130_osu_sc_18T_ms__inv_2	0.00000	0.00007	0.00008
sky130_osu_sc_18T_ms__inv_3	0.00000	0.00011	0.00013
sky130_osu_sc_18T_ms__inv_4	0.00000	0.00015	0.00017
sky130_osu_sc_18T_ms__inv_6	0.00000	0.00022	0.00025
sky130_osu_sc_18T_ms__inv_8	0.00000	0.00030	0.00034
sky130_osu_sc_18T_ms__inv_l	0.00000	0.00003	0.00004

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)**	0.11051	1.43726	13.16650
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.12473	0.99106	13.20400
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.08206	1.23295	13.21110
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.08675	1.16105	13.15820
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.08488	1.10370	13.17540
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.09276	1.04351	13.17850
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.10695	1.01064	13.16680
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.15044	1.64153	13.26630

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)**	0.04823	0.79991	7.96622
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.06988	0.64570	7.97435
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.04009	0.73616	7.98054
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.04297	0.71213	7.99338
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.04291	0.69056	7.99514
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.05107	0.66945	7.99968
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.06002	0.65690	7.99365
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.05675	0.83355	7.81234

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	0.00377	0.00368	0.00369
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03285	0.03273	0.03347
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00678	0.00668	0.00685
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01039	0.01025	0.01035
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01339	0.01323	0.01328
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01993	0.01972	0.02029
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02642	0.02621	0.02691
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00291	0.00285	0.00282

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	-0.00062	-0.00065	-0.00066
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01141	-0.01104	-0.01051
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00212	-0.00217	-0.00216
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00273	-0.00279	-0.00278
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00432	-0.00435	-0.00427
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00655	-0.00656	-0.00638
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00891	-0.00878	-0.00848
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00046	-0.00049	-0.00051

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.28600	0.28840	0.01011	0.45997

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.00013	0.00013

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)	-	0.07038	0.99730	9.60926
	A1->Y (RR)	-	0.07736	1.00625	9.63171
	S0->Y (RR)	(!A0 * A1)	0.15246	1.15563	9.05093
	S0->Y (FR)	(A0 * !A1)	0.13593	1.33908	10.86980

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)	-	0.04902	0.76823	7.67221
	A1->Y (FF)	-	0.04226	0.76044	7.64915
	S0->Y (FF)	(!A0 * A1)	0.27041	1.06689	8.10431
	S0->Y (RF)	(A0 * !A1)	0.05497	0.79827	7.53887

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	-	-0.00392	-0.00393	-0.00393
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00279	-0.00279	-0.00280
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00485	0.00460	0.00454
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00240	-0.00268	-0.00287

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	-	0.00392	0.00393	0.00393
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00279	0.00279	0.00280
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00093	0.00067	0.00048
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00986	0.00962	0.00954

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)	-0.00112	-0.00112	-0.00112

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)	0.00112	0.00112	0.00112

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)	-0.00133	-0.00133	-0.00133

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)	0.00133	0.00133	0.00133

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)	-0.00074	-0.00103	-0.00120
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00073	-0.00101	-0.00117

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)	0.00750	0.00726	0.00718
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00721	0.00697	0.00691

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00499	0.00491	0.49894
sky130_osu_sc_18T_ms__nand2_l	0.00384	0.00379	0.29984

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.00005	0.00008
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.00005	0.00007

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)	0.11686	1.44067	13.13830
	B->Y (FR)	0.13612	1.45602	13.09080
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.15644	1.64970	13.27190
	B->Y (FR)	0.18084	1.67401	13.27330

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)	0.07734	0.99549	9.33747
	B->Y (RF)	0.08633	1.00227	9.25650
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.09521	1.07643	9.17198
	B->Y (RF)	0.10421	1.08449	9.09814

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	0.00401	0.00392	0.00392
	B	0.00000	0.00000	0.00000
	B	0.00485	0.00475	0.00472
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00306	0.00300	0.00296
	B	0.00000	0.00000	0.00000
	B	0.00366	0.00359	0.00357

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	-0.00035	-0.00039	-0.00041
	B	0.00000	0.00000	0.00000
	B	-0.00033	-0.00038	-0.00038
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00033	-0.00034
	B	0.00000	0.00000	0.00000
	B	-0.00029	-0.00031	-0.00033

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)	-0.00258	-0.00259	-0.00260
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00189	-0.00190	-0.00190

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)	0.00259	0.00264	0.00260
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00190	0.00191	0.00191

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)	-0.00238	-0.00240	-0.00239
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00175	-0.00176	-0.00175

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)	0.00238	0.00241	0.00240
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00175	0.00177	0.00176

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00492	0.00529	0.20926
sky130_osu_sc_18T_ms__nor2_l	0.00373	0.00411	0.12316

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.00005	0.00007
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.00005	0.00007

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)	0.32937	2.07929	14.22460
	B->Y (FR)	0.27929	1.94530	13.48300
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.44484	2.43470	14.28850
	B->Y (FR)	0.39978	2.30732	13.66050

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)	0.05531	0.70198	6.27593
	B->Y (RF)	0.05005	0.69287	6.25532
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.06319	0.72724	6.20819
	B->Y (RF)	0.05865	0.72018	6.18819

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	0.00483	0.00475	0.00472
	B	0.00000	0.00000	0.00000
	B	0.00413	0.00399	0.00398
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00356	0.00349	0.00346
	B	0.00000	0.00000	0.00000
	B	0.00314	0.00302	0.00299

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	0.00023	0.00013	0.00003
	B	0.00000	0.00000	0.00000
	B	-0.00056	-0.00057	-0.00064
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00012	0.00004	-0.00003
	B	0.00000	0.00000	0.00000
	B	-0.00039	-0.00040	-0.00045

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)	-0.00221	-0.00227	-0.00225
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00157	-0.00161	-0.00160

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)	0.00224	0.00227	0.00225
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00160	0.00162	0.00160

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)	-0.00151	-0.00154	-0.00151
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00110	-0.00112	-0.00110

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)	0.00154	0.00154	0.00152
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00112	0.00113	0.00111

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00499	0.00498	0.00429	0.20490

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.00005	0.00008

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)	0.37862	2.04164	13.46700
	A1->Y (FR)	0.43975	2.18374	14.22090
	B0->Y (FR)	0.19364	1.47836	11.21090

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)	0.10390	0.84872	6.98606
	A1->Y (RF)	0.11210	0.84892	6.96848
	B0->Y (RF)	0.08600	0.83884	7.14327

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	0.00529	0.00516	0.00511
	A1	0.00000	0.00000	0.00000
	A1	0.00603	0.00593	0.00589
	B0	0.00417	0.00401	0.00388

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	0.00027	0.00025	0.00019
	A1	0.00000	0.00000	0.00000
	A1	0.00109	0.00098	0.00090
	B0	0.00157	0.00153	0.00145

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)	-0.00151	-0.00154	-0.00152
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00222	-0.00226	-0.00226
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00233	-0.00234	-0.00234

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)	0.00154	0.00156	0.00152
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00225	0.00226	0.00226
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00234	0.00234	0.00235

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)	-0.00217	-0.00221	-0.00221
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00221	-0.00225	-0.00225
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00231	-0.00233	-0.00232

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)	0.00220	0.00221	0.00221
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00224	0.00225	0.00225
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00231	0.00233	0.00232

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)	-0.00191	-0.00192	-0.00196

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)	0.00196	0.00198	0.00197

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00475	0.00510	0.00529	0.00511	0.20519

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.00008	0.00010

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)	0.48524	2.23232	14.26670
	A1->Y (FR)	0.43212	2.09363	13.51690
	B0->Y (FR)	0.30754	1.95809	13.37950
	B1->Y (FR)	0.36410	2.10014	14.12860

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)	0.14180	0.90241	7.07464
	A1->Y (RF)	0.12334	0.87694	7.02928
	B0->Y (RF)	0.10342	0.85942	7.17922
	B1->Y (RF)	0.12428	0.89112	7.28395

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	0.00754	0.00744	0.00739
	A1	0.00677	0.00662	0.00657
	B0	0.00515	0.00501	0.00497
	B1	0.00596	0.00585	0.00532

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00147	0.00137	0.00126
	A1	0.00069	0.00068	0.00058
	B0	0.00071	0.00069	0.00057
	B1	0.00150	0.00140	0.00126

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)	-0.00221	-0.00227	-0.00225
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00221	-0.00227	-0.00225
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00221	-0.00227	-0.00226
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00232	-0.00233	-0.00232

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)	0.00224	0.00227	0.00225
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00224	0.00227	0.00225
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00224	0.00228	0.00226
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00232	0.00236	0.00233

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)	-0.00150	-0.00153	-0.00150
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00150	-0.00153	-0.00150
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00220	-0.00224	-0.00224
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00231	-0.00232	-0.00232

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)	0.00153	0.00153	0.00151
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00153	0.00153	0.00151
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00223	0.00224	0.00224
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00231	0.00232	0.00232

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)	-0.00149	-0.00152	-0.00150
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00149	-0.00150	-0.00150
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00246	-0.00250	-0.00250
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00249	-0.00250	-0.00257

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)	0.00153	0.00153	0.00151
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00153	0.00153	0.00151
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00249	0.00250	0.00250
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00257	0.00258	0.00258

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)	-0.00217	-0.00223	-0.00222
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00217	-0.00223	-0.00222
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00250	-0.00257	-0.00255
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00252	-0.00255	-0.00260

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)	0.00220	0.00223	0.00222
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00220	0.00223	0.00222
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00253	0.00257	0.00255
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00260	0.00267	0.00262

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00525	0.00510	0.51052
sky130_osu_sc_18T_ms__or2_2	0.00525	0.00510	1.01633
sky130_osu_sc_18T_ms__or2_4	0.00520	0.00510	1.95356
sky130_osu_sc_18T_ms__or2_8	0.00520	0.00510	3.81936
sky130_osu_sc_18T_ms__or2_l	0.00413	0.00392	0.30638

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.00008	0.00011
sky130_osu_sc_18T_ms__or2_2	0.00000	0.00012	0.00015
sky130_osu_sc_18T_ms__or2_4	0.00000	0.00019	0.00023
sky130_osu_sc_18T_ms__or2_8	0.00000	0.00033	0.00040
sky130_osu_sc_18T_ms__or2_l	0.00000	0.00008	0.00010

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)	0.19605	1.42227	10.13560
	B->Y (RR)	0.18633	1.40438	10.01230
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.20508	1.28360	10.43240
	B->Y (RR)	0.19470	1.26722	10.34610
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.27127	1.23944	10.81280
	B->Y (RR)	0.26050	1.22825	10.74760
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.40432	1.30234	11.50590
	B->Y (RR)	0.39311	1.29280	11.45620
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.24868	1.66163	10.47990
	B->Y (RR)	0.23890	1.64467	10.36740

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)	0.64071	1.54118	9.30373
	B->Y (FF)	0.56819	1.38843	8.61143
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.83583	1.73564	9.71400
	B->Y (FF)	0.76438	1.58869	9.07129
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	1.25292	2.19279	10.38700
	B->Y (FF)	1.18177	2.04442	9.80620
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	2.07082	3.11015	11.54720
	B->Y (FF)	1.99967	2.95891	10.91350
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.82529	1.75477	9.35305
	B->Y (FF)	0.74180	1.59485	8.75683

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	0.00390	0.00371	0.00349
	B	0.00000	0.00000	0.00000
	B	0.00307	0.00292	0.00270
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00686	0.00682	0.00665
	B	0.00000	0.00000	0.00000
	B	0.00601	0.00607	0.00586
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01330	0.01351	0.01342
	B	0.00000	0.00000	0.00000
	B	0.01242	0.01276	0.01278
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02604	0.02675	0.02692
	B	0.00000	0.00000	0.00000
	B	0.02516	0.02606	0.02633
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00276	0.00260
	B	0.00000	0.00000	0.00000
	B	0.00235	0.00224	0.00208

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	0.00829	0.00824	0.00819
	B	0.00000	0.00000	0.00000
	B	0.00737	0.00733	0.00725
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01022	0.01050	0.01046
	B	0.00000	0.00000	0.00000
	B	0.00931	0.00958	0.00952
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01503	0.01582	0.01600
	B	0.00000	0.00000	0.00000
	B	0.01412	0.01490	0.01501
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02458	0.02607	0.02712
	B	0.00000	0.00000	0.00000
	B	0.02366	0.02516	0.02603
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00633	0.00627	0.00622
	B	0.00000	0.00000	0.00000
	B	0.00568	0.00562	0.00556

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)	-0.00222	-0.00225	-0.00227
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00223	-0.00225	-0.00227
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00223	-0.00228	-0.00227
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00223	-0.00225	-0.00227
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00159	-0.00162	-0.00161

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)	0.00225	0.00225	0.00227
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00225	0.00225	0.00227
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00225	0.00229	0.00227
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00225	0.00225	0.00227
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00160	0.00162	0.00161

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)	-0.00151	-0.00154	-0.00152
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00154	-0.00152
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00154	-0.00152
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00154	-0.00152
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00112	-0.00113	-0.00112

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)	0.00155	0.00156	0.00153
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00155	0.00157	0.00153
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00155	0.00157	0.00153
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00155	0.00157	0.00153
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00114	0.00115	0.00112

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00529	0.00668	0.20688
sky130_osu_sc_18T_ms__tbufi_l	0.00412	0.00520	0.12319

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.00006	0.00008
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.00006	0.00007

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)	0.26342	1.92141	13.37960
	OE->Y (FR)	0.16872	0.74159	5.68124
	OE->Y (RR)	0.35281	1.93924	10.54060
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.38028	2.29131	13.65040
	OE->Y (FR)	0.21155	0.78623	5.93761
	OE->Y (RR)	0.46476	2.32357	10.98200

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)	0.07342	0.80241	6.96010
	OE->Y (FF)	0.16984	0.74380	5.68332
	OE->Y (RF)	0.07372	0.79899	6.87284
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.09195	0.85506	6.90176
	OE->Y (FF)	0.21207	0.78619	5.94066
	OE->Y (RF)	0.09226	0.85220	6.82646

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	0.00381	0.00367	0.00363
	OE	0.00000	0.00000	0.00000
	OE	0.00345	0.00316	0.00302
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00291	0.00280	0.00275
	OE	0.00000	0.00000	0.00000
	OE	0.00250	0.00229	0.00216

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	-0.00056	-0.00057	-0.00064
	OE	0.00000	0.00000	0.00000
	OE	0.00276	0.00248	0.00232
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00040	-0.00046
	OE	0.00000	0.00000	0.00000
	OE	0.00194	0.00173	0.00161

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)	-0.00213	-0.00216	-0.00214
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00203	-0.00206	-0.00204
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00162	-0.00164	-0.00163
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00155	-0.00158	-0.00156

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)	0.00213	0.00216	0.00214
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00209	0.00208	0.00207
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00162	0.00164	0.00163
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00159	0.00159	0.00158

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)	0.00151	0.00123	0.00107
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00138	0.00110	0.00093
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00105	0.00085	0.00071
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00096	0.00074	0.00062

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)	0.00429	0.00401	0.00394
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00443	0.00417	0.00404
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00342	0.00319	0.00311
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00352	0.00329	0.00319

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.00528	0.00814	0.20946
sky130_osu_sc_18T_ms__tnbufi_l	0.00411	0.00612	0.12320

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.00006	0.00007
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.00006	0.00007

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)	0.26588	1.93061	13.47210
	OE->Y (RR)	0.05423	0.44660	3.77858
	OE->Y (FR)	0.29681	2.04998	14.19890
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.38317	2.29091	13.65030
	OE->Y (RR)	0.06010	0.47677	3.77879
	OE->Y (FR)	0.39932	2.39636	14.25940

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)	0.07206	0.80437	6.98668
	OE->Y (RF)	0.05387	0.44372	3.77857
	OE->Y (FF)	0.20524	1.04305	7.33007
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.08970	0.85404	6.90130
	OE->Y (RF)	0.05958	0.47421	3.77880
	OE->Y (FF)	0.26275	1.12819	7.44489

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	0.00391	0.00377	0.00374
	OE	0.00000	0.00000	0.00000
	OE	0.00898	0.00876	0.00873
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00302	0.00290	0.00285
	OE	0.00000	0.00000	0.00000
	OE	0.00674	0.00657	0.00652

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	-0.00068	-0.00068	-0.00076
	OE	0.00000	0.00000	0.00000
	OE	0.00841	0.00819	0.00813
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00051	-0.00052	-0.00057
	OE	0.00000	0.00000	0.00000
	OE	0.00627	0.00608	0.00603

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)	-0.00187	-0.00189	-0.00187
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00177	-0.00180	-0.00178
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00137	-0.00139	-0.00137
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00130	-0.00133	-0.00131

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)	0.00187	0.00189	0.00187
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00182	0.00182	0.00182
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00137	0.00139	0.00137
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00134	0.00135	0.00133

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)	-0.00271	-0.00308	-0.00326
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00261	-0.00301	-0.00322
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00191	-0.00218	-0.00230
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00184	-0.00213	-0.00227

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)	0.00704	0.00684	0.00681
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00691	0.00672	0.00668
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00528	0.00512	0.00508
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00520	0.00504	0.00499

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.01040	0.00935	0.20557

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.00016	0.00017

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	0.46002	2.05288	10.73620
	A->Y (FR)	!B	0.35768	2.02055	13.44270
	B->Y (RR)	A	0.38573	1.97447	10.58540
	B->Y (FR)	!A	0.41514	2.15262	14.16500

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	0.32060	1.16411	7.74630
	A->Y (RF)	!B	0.10991	0.83663	6.94455
	B->Y (FF)	A	0.31357	1.15325	7.73253
	B->Y (RF)	!A	0.11669	0.84525	6.96180

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	0.00316	0.00283	0.00259
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00935	0.00895	0.00887
	B	A	0.00000	0.00000	0.00000
	B	A	0.00175	0.00146	0.00122
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00974	0.00940	0.00933

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	0.01100	0.01073	0.01049
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00260	0.00232	0.00208
	B	A	0.00000	0.00000	0.00000
	B	A	0.01035	0.01020	0.01005
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00310	0.00274	0.00246

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.01037	0.00941	0.20466

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.00016	0.00018

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	0.47491	2.05462	10.61570
	A->Y (FR)	B	0.37651	2.10359	14.10500
	B->Y (RR)	!A	0.39248	1.97848	10.58220
	B->Y (FR)	A	0.41285	2.15331	14.15880

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	0.32364	1.15489	7.72201
	A->Y (RF)	B	0.09186	0.82439	6.97412
	B->Y (FF)	!A	0.30708	1.14045	7.66805
	B->Y (RF)	A	0.10413	0.82992	6.89300

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	0.01046	0.01011	0.01001
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00220	0.00168	0.00139
	B	A	0.00000	0.00000	0.00000
	B	A	0.01064	0.01032	0.01025
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00152	0.00123	0.00100

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	0.00214	0.00176	0.00145
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01158	0.01138	0.01130
	B	A	0.00000	0.00000	0.00000
	B	A	0.00213	0.00176	0.00148
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01059	0.01047	0.01033

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

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	0.07284
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	38533.00000	77065.90000
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
	-0.00262	0.00304	0.05790

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
	0.67223	0.62304	0.09199