sky130_osu_sc_18T_ms_ss_1P60_150C.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_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.02312	0.02305	0.01755	2.18256	1.02209	2.10745
sky130_osu_sc_18T_ms__addf_l	0.02311	0.02305	0.01752	1.54766	1.02234	1.58571

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	14.46610	17.87250
sky130_osu_sc_18T_ms__addf_l	0.00000	14.79460	18.20100

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)	0.25516	2.43104	31.74420
	B->CO (RR)	0.25705	2.37475	30.74210
	CI->CO (RR)	0.24337	2.46807	32.34790
	CON->CO (FR)	0.03734	0.81658	10.81090
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.24919	2.18471	25.06410
	B->CO (RR)	0.25136	2.14533	24.50660
	CI->CO (RR)	0.23725	2.22157	25.67920
	CON->CO (FR)	0.03807	0.82323	10.03350

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.28934	2.67602	34.96130
	B->CO (FF)	0.26124	2.58869	34.13670
	CI->CO (FF)	0.25499	2.66119	35.26030
	CON->CO (RF)	0.04045	0.88650	11.73730
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.28523	2.47127	28.32500
	B->CO (FF)	0.25724	2.39510	27.80250
	CI->CO (FF)	0.25086	2.45690	28.64840
	CON->CO (RF)	0.04446	0.95528	11.66990

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)	0.19204	1.03798	9.77230
	B->CON (FR)	0.16698	1.00050	9.81073
	CI->CON (FR)	0.15772	1.02651	10.14380
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.18211	1.02771	9.76414
	B->CON (FR)	0.15756	0.99396	9.80274
	CI->CON (FR)	0.14769	1.01656	10.13530

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)	0.18364	1.02506	9.81939
	B->CON (RF)	0.18666	1.03310	9.97953
	CI->CON (RF)	0.17187	1.06372	10.46820
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.17592	1.01804	9.81336
	B->CON (RF)	0.17935	1.02621	9.97419
	CI->CON (RF)	0.16414	1.05628	10.46230

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-R)	0.42087	2.38298	26.30980
	B->S (-R)	0.47366	2.44335	25.78150
	CI->S (-R)	0.38448	2.36177	26.60780
	CON->S (RR)	0.13008	0.85945	8.44935
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.39501	2.16717	21.76590
	B->S (-R)	0.44795	2.23507	21.45210
	CI->S (-R)	0.35840	2.14774	22.08430
	CON->S (RR)	0.12349	0.84997	7.82920

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)	0.41822	2.31090	24.33860
	B->S (-F)	0.40916	2.20534	23.52800
	CI->S (-F)	0.40556	2.34268	24.95460
	CON->S (FF)	0.15650	0.87752	7.78821
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.39987	2.19754	21.38730
	B->S (-F)	0.38979	2.11000	20.91280
	CI->S (-F)	0.38705	2.22873	22.01000
	CON->S (FF)	0.15376	0.94349	8.13194

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	0.00385	0.00512	0.02736
	B	0.00619	0.00703	0.02648
	CI	0.00632	0.00773	0.03008
sky130_osu_sc_18T_ms__addf_l	A	0.00281	0.00366	0.01810
	B	0.00516	0.00559	0.01841
	CI	0.00528	0.00624	0.02091

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01589	0.01711	0.04138
	B	0.01693	0.01798	0.03921
	CI	0.01323	0.01453	0.03925
sky130_osu_sc_18T_ms__addf_l	A	0.01486	0.01573	0.03230
	B	0.01590	0.01668	0.03089
	CI	0.01221	0.01317	0.03060

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01573	0.01637	0.02773
	B	0.01618	0.01670	0.02741
	CI	0.01479	0.01564	0.02627
sky130_osu_sc_18T_ms__addf_l	A	0.01475	0.01535	0.02639
	B	0.01520	0.01574	0.02606
	CI	0.01377	0.01458	0.02490

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00374	0.00452	0.01523
	B	0.00605	0.00639	0.01585
	CI	0.00619	0.00703	0.01777
sky130_osu_sc_18T_ms__addf_l	A	0.00274	0.00340	0.01331
	B	0.00506	0.00528	0.01407
	CI	0.00519	0.00591	0.01591

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01581	0.01701	0.04020
	B	0.01687	0.01791	0.03824
	CI	0.01316	0.01443	0.03822
sky130_osu_sc_18T_ms__addf_l	A	0.01480	0.01570	0.03257
	B	0.01585	0.01664	0.03122
	CI	0.01215	0.01313	0.03067

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.03565	0.03619	0.05566
	B	0.03162	0.03242	0.05792
	CI	0.02877	0.02906	0.04794
sky130_osu_sc_18T_ms__addf_l	A	0.03441	0.03476	0.05457
	B	0.03043	0.03121	0.05719
	CI	0.02755	0.02772	0.04706

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.01138	0.01232	2.12903	1.08092	2.16201
sky130_osu_sc_18T_ms__addh_l	0.01138	0.01232	1.32940	1.08150	1.35027

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__addh_1	0.00000	15.94960	18.23730
sky130_osu_sc_18T_ms__addh_l	0.00000	9.75393	13.26000

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)	0.16770	0.91537	8.51652
	B->CO (RR)	0.17474	0.89354	8.50874
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.16456	0.97303	8.32513
	B->CO (RR)	0.17153	0.95409	8.30509

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)	0.13113	0.82304	7.63983
	B->CO (FF)	0.13900	0.84227	7.69984
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.13292	0.92436	7.85300
	B->CO (FF)	0.14060	0.94451	7.91554

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	0.22362	0.79319	5.16411
	A->CON (FR)	!B	0.10728	0.95583	10.08100
	B->CON (RR)	A	0.22928	0.77150	5.16012
	B->CON (FR)	!A	0.13494	0.97041	9.82166
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.19911	0.75821	5.10854
	A->CON (FR)	!B	0.09484	0.94678	10.07150
	B->CON (RR)	A	0.20492	0.73758	5.08542
	B->CON (FR)	!A	0.12253	0.95696	9.81152

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	0.22453	0.97498	6.97717
	A->CON (RF)	!B	0.10747	0.99800	10.55460
	B->CON (FF)	A	0.21389	1.01175	7.37769
	B->CON (RF)	!A	0.13451	1.00003	10.25660
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.20263	0.92575	6.75405
	A->CON (RF)	!B	0.09775	0.98765	10.54630
	B->CON (FF)	A	0.19212	0.96393	7.15573
	B->CON (RF)	!A	0.12492	0.99047	10.25010

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	0.17380	2.33573	31.45280
	A->S (FR)	B	0.29217	2.30076	27.72940
	B->S (RR)	!A	0.20205	2.30166	30.47860
	B->S (FR)	A	0.28084	2.37400	28.80350
	CON->S (FR)	-	0.04089	0.83313	10.97810
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.16918	2.10970	24.16960
	A->S (FR)	B	0.27582	2.04060	20.25350
	B->S (RR)	!A	0.19795	2.08992	23.52050
	B->S (FR)	A	0.26426	2.10226	20.99870
	CON->S (FR)	-	0.04503	0.92114	10.86470

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	0.18828	2.45498	33.20130
	A->S (RF)	B	0.29066	1.87805	21.45100
	B->S (FF)	!A	0.21599	2.47290	33.02130
	B->S (RF)	A	0.29635	1.85516	21.43440
	CON->S (RF)	-	0.03860	0.86549	11.41360
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.18390	2.24309	25.65770
	A->S (RF)	B	0.27207	1.76928	17.11980
	B->S (FF)	!A	0.21166	2.25926	25.43630
	B->S (RF)	A	0.27786	1.74980	17.09690
	CON->S (RF)	-	0.04578	0.99169	11.74070

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	0.00718	0.00720	0.01489
	B	0.00000	0.00000	0.00000
	B	0.00633	0.00620	0.01466
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00577	0.00570	0.01421
	B	0.00000	0.00000	0.00000
	B	0.00493	0.00471	0.01362

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	0.01141	0.01164	0.02510
	B	0.00000	0.00000	0.00000
	B	0.01168	0.01260	0.02697
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00999	0.01001	0.02110
	B	0.00000	0.00000	0.00000
	B	0.01029	0.01089	0.02240

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	0.00711	0.00712	0.01508
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00984	0.01009	0.01513
	B	A	0.00000	0.00000	0.00000
	B	A	0.00626	0.00615	0.01502
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01121	0.01129	0.01510
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00572	0.00565	0.01423
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00882	0.00915	0.01287
	B	A	0.00000	0.00000	0.00000
	B	A	0.00487	0.00466	0.01367
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01020	0.01013	0.01281

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	0.01139	0.01155	0.02271
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00190	0.00222	0.00657
	B	A	0.00000	0.00000	0.00000
	B	A	0.01168	0.01245	0.02493
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00291	0.00303	0.00726
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00998	0.01001	0.02091
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00064	0.00080	0.00340
	B	A	0.00000	0.00000	0.00000
	B	A	0.01028	0.01086	0.02223
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00164	0.00159	0.00414

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	0.01150	0.01174	0.02547
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00210	0.00260	0.00934
	B	A	0.00000	0.00000	0.00000
	B	A	0.01180	0.01273	0.02736
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00307	0.00335	0.00955
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01003	0.01006	0.02136
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00073	0.00089	0.00359
	B	A	0.00000	0.00000	0.00000
	B	A	0.01034	0.01097	0.02250
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00171	0.00168	0.00417

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	0.00724	0.00726	0.01534
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00996	0.01054	0.01606
	B	A	0.00000	0.00000	0.00000
	B	A	0.00638	0.00626	0.01521
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01134	0.01170	0.01659
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00580	0.00573	0.01449
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00884	0.00917	0.01272
	B	A	0.00000	0.00000	0.00000
	B	A	0.00495	0.00474	0.01380
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01022	0.01031	0.01284

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00610	0.00621	2.14164
sky130_osu_sc_18T_ms__and2_2	0.00610	0.00622	4.17612
sky130_osu_sc_18T_ms__and2_4	0.00610	0.00621	8.01762
sky130_osu_sc_18T_ms__and2_6	0.00614	0.00622	11.91576
sky130_osu_sc_18T_ms__and2_8	0.00612	0.00623	15.48663
sky130_osu_sc_18T_ms__and2_l	0.00461	0.00473	1.55988

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	7.49985	11.62950
sky130_osu_sc_18T_ms__and2_2	0.00000	11.63970	11.68300
sky130_osu_sc_18T_ms__and2_4	0.00000	20.28920	23.16850
sky130_osu_sc_18T_ms__and2_6	0.00000	28.93860	34.65390
sky130_osu_sc_18T_ms__and2_8	0.00000	37.58800	46.13920
sky130_osu_sc_18T_ms__and2_l	0.00000	7.95376	12.46080

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)	0.12774	0.82246	8.32777
	B->Y (RR)	0.13645	0.81006	8.19491
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.14894	0.78848	8.43727
	B->Y (RR)	0.15774	0.76741	8.30378
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.20492	0.84005	8.75800
	B->Y (RR)	0.21371	0.80816	8.60520
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.26037	0.90884	9.10953
	B->Y (RR)	0.26901	0.87205	8.92899
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.31522	0.97546	9.38159
	B->Y (RR)	0.32396	0.93860	9.18181
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.13748	0.85353	7.79332
	B->Y (RR)	0.14702	0.83860	7.65202

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)	0.10160	0.72386	7.14661
	B->Y (FF)	0.10673	0.74535	7.21672
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.11531	0.67755	7.22575
	B->Y (FF)	0.12148	0.69683	7.29747
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.15920	0.71522	7.51695
	B->Y (FF)	0.16553	0.72730	7.59056
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.20678	0.77495	7.84372
	B->Y (FF)	0.21317	0.78474	7.91124
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.25162	0.82740	7.96576
	B->Y (FF)	0.25810	0.83641	8.02734
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.10351	0.80708	7.42802
	B->Y (FF)	0.10857	0.82947	7.52174

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	0.00568	0.00634	0.03670
	B	0.00000	0.00000	0.00000
	B	0.00578	0.00562	0.02891
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01137	0.01214	0.04106
	B	0.00000	0.00000	0.00000
	B	0.01147	0.01152	0.03345
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02426	0.02494	0.05244
	B	0.00000	0.00000	0.00000
	B	0.02442	0.02441	0.04482
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03845	0.03779	0.06408
	B	0.00000	0.00000	0.00000
	B	0.03855	0.03758	0.05760
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.05401	0.05168	0.07644
	B	0.00000	0.00000	0.00000
	B	0.05424	0.05042	0.06897
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00421	0.00471	0.02671
	B	0.00000	0.00000	0.00000
	B	0.00431	0.00418	0.02105

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	0.01345	0.01536	0.04602
	B	0.00000	0.00000	0.00000
	B	0.01512	0.01676	0.04636
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01700	0.01949	0.04983
	B	0.00000	0.00000	0.00000
	B	0.01870	0.02083	0.05020
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02630	0.02972	0.05961
	B	0.00000	0.00000	0.00000
	B	0.02795	0.03072	0.05965
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03605	0.03954	0.06962
	B	0.00000	0.00000	0.00000
	B	0.03779	0.04044	0.06941
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04720	0.04931	0.07976
	B	0.00000	0.00000	0.00000
	B	0.04883	0.04994	0.07877
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01028	0.01154	0.03300
	B	0.00000	0.00000	0.00000
	B	0.01150	0.01260	0.03352

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)	-0.00515	-0.00517	-0.00522
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00510	-0.00513	-0.00517
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00500	-0.00504	-0.00507
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00493	-0.00495	-0.00499
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00480	-0.00482	-0.00487
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00370	-0.00373	-0.00374

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)	0.00531	0.00538	0.00534
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00536	0.00543	0.00539
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00546	0.00552	0.00549
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00558	0.00564	0.00561
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00566	0.00572	0.00569
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00385	0.00392	0.00387

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)	-0.00494	-0.00497	-0.00496
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00490	-0.00492	-0.00491
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00480	-0.00482	-0.00481
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00470	-0.00472	-0.00471
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00460	-0.00462	-0.00461
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00355	-0.00356	-0.00356

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)	0.00512	0.00516	0.00508
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00517	0.00520	0.00513
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00527	0.00530	0.00523
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00537	0.00540	0.00533
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00547	0.00550	0.00543
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00371	0.00373	0.00368

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00584	0.00602	0.00582	1.01721

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	3.19450	6.17514

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)	0.10541	0.95050	9.67919
	A1->Y (FR)	0.09164	0.91207	9.42210
	B0->Y (FR)	0.07467	0.93761	10.04170

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)	0.10502	0.91238	9.32868
	A1->Y (RF)	0.09707	0.93935	9.87445
	B0->Y (RF)	0.05420	0.83992	9.21847

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	0.01233	0.01229	0.01624
	A1	0.00000	0.00000	0.00000
	A1	0.01053	0.01050	0.01446
	B0	0.00739	0.00774	0.01351

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	0.00305	0.00263	0.00565
	A1	0.00000	0.00000	0.00000
	A1	0.00308	0.00293	0.00633
	B0	-0.00126	-0.00109	0.00196

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)	-0.00371	-0.00455	-0.00468
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00471	-0.00474	-0.00473
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00476	-0.00479	-0.00478

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)	0.00476	0.00482	0.00481
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00482	0.00489	0.00484
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00484	0.00484	0.00479

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)	-0.00368	-0.00452	-0.00464
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00468	-0.00468	-0.00468
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00500	-0.00503	-0.00507

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)	0.00473	0.00478	0.00476
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00478	0.00481	0.00480
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00506	0.00516	0.00509

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)	-0.00209	-0.00214	-0.00210

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)	0.00237	0.00238	0.00219

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00584	0.00603	0.00620	0.00597	0.98049

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	3.50525	11.48290

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)	0.13209	0.98012	9.58496
	A1->Y (FR)	0.11868	0.95334	9.45292
	B0->Y (FR)	0.07831	0.93049	9.82352
	B1->Y (FR)	0.09193	0.95746	10.01410

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)	0.14250	0.93961	9.15971
	A1->Y (RF)	0.13464	0.96945	9.70598
	B0->Y (RF)	0.06640	0.89768	9.64010
	B1->Y (RF)	0.07469	0.86547	9.09441

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	0.01529	0.01522	0.01922
	A1	0.01351	0.01340	0.01739
	B0	0.00803	0.00845	0.01563
	B1	0.00981	0.00999	0.01737

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00614	0.00568	0.00878
	A1	0.00617	0.00600	0.00947
	B0	-0.00070	-0.00051	0.00306
	B1	-0.00058	-0.00074	0.00242

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)	-0.00351	-0.00448	-0.00463
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00466	-0.00469	-0.00468
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00476	-0.00479	-0.00478
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00476	-0.00479	-0.00478

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)	0.00483	0.00486	0.00486
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00487	0.00494	0.00489
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00484	0.00484	0.00479
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00484	0.00484	0.00479

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)	-0.00347	-0.00445	-0.00458
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00463	-0.00466	-0.00463
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00500	-0.00503	-0.00506
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00500	-0.00503	-0.00506

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)	0.00478	0.00481	0.00482
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00483	0.00483	0.00485
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00506	0.00515	0.00508
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00506	0.00515	0.00508

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)	-0.00211	-0.00215	-0.00211
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00199	-0.00202	-0.00204
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00511	-0.00515	-0.00518
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00511	-0.00515	-0.00517

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)	0.00248	0.00249	0.00222
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00214	0.00214	0.00214
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00517	0.00518	0.00519
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00517	0.00518	0.00519

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)	-0.00212	-0.00216	-0.00212
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00200	-0.00204	-0.00205
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00482	-0.00483	-0.00484
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00482	-0.00483	-0.00484

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)	0.00249	0.00250	0.00224
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00214	0.00217	0.00216
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00490	0.00489	0.00485
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00490	0.00489	0.00485

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00621	2.13241
sky130_osu_sc_18T_ms__buf_2	0.00622	4.19670
sky130_osu_sc_18T_ms__buf_4	0.00621	8.12904
sky130_osu_sc_18T_ms__buf_6	0.00098	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00622	15.62566
sky130_osu_sc_18T_ms__buf_l	0.00477	1.57116

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	6.10933	6.10937
sky130_osu_sc_18T_ms__buf_2	0.00000	8.86841	11.63000
sky130_osu_sc_18T_ms__buf_4	0.00000	14.68210	23.11540
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	26.30940	46.08610
sky130_osu_sc_18T_ms__buf_l	0.00000	6.43781	6.43786

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)**	0.09034	0.75995	8.01919
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.10130	0.70743	8.14160
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.13549	0.72934	8.45278
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.20083	0.81737	8.91703
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.09605	0.78554	7.51690

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)**	0.09700	0.71324	7.15281
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.11178	0.67256	7.32074
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.15586	0.71108	7.64899
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.24823	0.82397	8.05845
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.10023	0.80245	7.54158

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	0.00518	0.00580	0.03279
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01075	0.01173	0.03772
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02294	0.02440	0.04916
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04902	0.05036	0.07429
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00390	0.00447	0.02441

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	0.01297	0.01493	0.04651
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01650	0.01893	0.05009
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02579	0.02902	0.05947
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04675	0.04830	0.07876
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01000	0.01131	0.03384

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
	-0.00063	-0.00064	-0.00062

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
	0.00063	0.00064	0.00062

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00599	0.00594	0.01712	2.10157	2.10296
sky130_osu_sc_18T_ms__dffr_l	0.00599	0.00594	0.01712	1.54765	1.54089

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	21.82320	30.42630
sky130_osu_sc_18T_ms__dffr_l	0.00000	22.15170	30.75480

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RR)	0.43397	1.91902	19.82330
	QN->Q (FR)	0.04214	0.88726	11.65010
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.42506	2.02953	19.40980
	QN->Q (FR)	0.04131	0.88257	10.77140

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RF)	0.45827	2.01389	20.93210
	QN->Q (RF)	0.04519	0.97440	12.81440
	RN->Q (FF)	0.34086	1.85168	19.97220
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.45283	2.11848	20.22800
	QN->Q (RF)	0.04770	1.03499	12.64900
	RN->Q (FF)	0.33590	1.95601	19.25740

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->QN (RR)	0.39553	1.10591	8.36445
	RN->QN (FR)	0.27793	0.94393	7.40337
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.38495	1.09500	7.60503
	RN->QN (FR)	0.26792	0.93334	6.64114

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	**CK->QN (RF)**	0.37709	1.11069	8.64095
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.36619	1.16453	8.75078

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)	-0.12140	-0.12613	-0.12093
	setup	CK (R)	0.34054	0.35024	0.66412
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11791	-0.12480	-0.12239
	setup	CK (R)	0.33944	0.35201	0.67284

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)	-0.16711	-0.37948	-1.52544
	setup	CK (R)	0.21213	0.39950	1.55161
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.16508	-0.38126	-1.52321
	setup	CK (R)	0.21236	0.39950	1.55165

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)	-0.12140	-0.12613	-0.12093
	setup	CK (R)	0.34054	0.35024	0.66412
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11791	-0.12480	-0.12239
	setup	CK (R)	0.33944	0.35201	0.67284

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)	-0.16711	-0.37948	-1.52544
	setup	CK (R)	0.21213	0.39950	1.55161
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.16508	-0.38126	-1.52321
	setup	CK (R)	0.21236	0.39950	1.55165

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.25804	0.28607	0.89463
	removal	CK (R)	-0.04343	-0.04895	-0.11187
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.25834	0.28782	0.89988
	removal	CK (R)	-0.04343	-0.04895	-0.11187

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.25804	0.28607	0.89463
	removal	CK (R)	-0.04343	-0.04895	-0.11187
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.25834	0.28782	0.89988
	removal	CK (R)	-0.04343	-0.04895	-0.11187

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 ()	0.19652	0.60303	13.33370
	min_pulse_width	RN ()	0.19652	0.60303	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.18978	0.60303	13.33370
	min_pulse_width	RN ()	0.18754	0.60303	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 ()	0.20326	0.60303	13.33370
	min_pulse_width	CK ()	0.24144	0.60303	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.19427	0.60303	13.33370
	min_pulse_width	CK ()	0.23470	0.60303	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	CK ()	0.42560	0.60303	13.33370
	min_pulse_width	CK ()	0.17855	0.60303	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.42785	0.60303	13.33370
	min_pulse_width	CK ()	0.17855	0.60303	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	0.01340	0.01194	0.01186
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01185	0.01104	0.02320

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	0.01549	0.01405	0.00860
	RN	-0.00167	-0.09264	-1.34497
	RN	0.03468	0.03365	0.02990
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01394	0.01300	0.01822
	RN	-0.00167	-0.07711	-0.99047
	RN	0.03313	0.03259	0.03846

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	0.01534	0.01394	0.00862
	RN	-0.00167	-0.09268	-1.34363
	RN	0.03460	0.03354	0.02934
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01377	0.01284	0.01724
	RN	-0.00167	-0.07690	-0.98254
	RN	0.03302	0.03246	0.03810

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	0.01325	0.01183	0.01192
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01173	0.01093	0.02336

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	-0.00348	-0.00428	-0.00443
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01649	0.01592	0.03624
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00749	0.00700	0.02747
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00348	-0.00429	-0.00443
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01649	0.01592	0.03624
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00749	0.00700	0.02748

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	0.00497	0.00502	0.00501
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02801	0.02792	0.05030
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01325	0.01325	0.03514
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00498	0.00502	0.00501
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02801	0.02793	0.05030
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01325	0.01326	0.03514

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)	0.00506	0.00537	0.03817
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01395	0.01403	0.04735
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)	0.00506	0.00537	0.03818
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01396	0.01404	0.04735

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)	0.01199	0.01342	0.04823
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02606	0.02698	0.06192
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)	0.01199	0.01342	0.04824
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02606	0.02698	0.06193

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)	-0.00088	-0.00082	0.03167
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00770	0.00736	0.04109
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00138	-0.00121	0.03085
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00088	-0.00082	0.03167
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00771	0.00736	0.04109
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00137	-0.00121	0.03085

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)	0.01817	0.01974	0.05454
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04114	0.04123	0.07933
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03171	0.03256	0.06699
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04032	0.04267	0.10297
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02155	0.02294	0.05705
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01817	0.01976	0.05454
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04114	0.04123	0.07933
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03172	0.03256	0.06699
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04032	0.04267	0.10297
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02155	0.02294	0.05705

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00595	0.00595	0.01268	0.01736	2.16554	2.17558
sky130_osu_sc_18T_ms__dffsr_l	0.00595	0.00595	0.01266	0.01736	1.54649	1.54180

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	22.94290	30.85840
sky130_osu_sc_18T_ms__dffsr_l	0.00000	23.27130	31.18680

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RR)	0.46249	1.93621	19.80870
	QN->Q (FR)	0.04042	0.86979	11.51150
	RN->Q (RR)	0.36567	1.85649	19.74520
	SN->Q (FR)	0.32528	1.77667	19.02220
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.46338	2.07556	19.46110
	QN->Q (FR)	0.04123	0.88045	10.73920
	RN->Q (RR)	0.36695	1.99693	19.38840
	SN->Q (FR)	0.32640	1.91192	18.64510

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RF)	0.54145	2.08866	20.95870
	QN->Q (RF)	0.04197	0.93287	12.33360
	RN->Q (FF)	0.34837	1.85143	19.96150
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.54018	2.21490	20.29960
	QN->Q (RF)	0.04761	1.03378	12.63170
	RN->Q (FF)	0.34815	1.98044	19.29800

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RR)	0.47860	1.19944	8.51867
	RN->QN (FR)	0.28680	0.96435	7.52343
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.47013	1.19206	7.70704
	RN->QN (FR)	0.27967	0.95744	6.70716

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RF)	0.40800	1.13946	8.64510
	RN->QN (RF)	0.31133	1.06019	8.58240
	SN->QN (FF)	0.27113	0.97998	7.86027
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.40517	1.21255	8.82915
	RN->QN (RF)	0.30902	1.13454	8.76122
	SN->QN (FF)	0.26850	1.04933	8.02531

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)	-0.13817	-0.14586	-0.19812
	setup	CK (R)	0.35493	0.36266	0.74097
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.13611	-0.14649	-0.19619
	setup	CK (R)	0.35482	0.36249	0.74440

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)	-0.19209	-0.40732	-1.60933
	setup	CK (R)	0.26363	0.42217	1.63544
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.19370	-0.40642	-1.60967
	setup	CK (R)	0.26386	0.42203	1.63551

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)	-0.13817	-0.14586	-0.19812
	setup	CK (R)	0.35493	0.36266	0.74097
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.13611	-0.14649	-0.19619
	setup	CK (R)	0.35482	0.36249	0.74440

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)	-0.19209	-0.40732	-1.60933
	setup	CK (R)	0.26363	0.42217	1.63544
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.19370	-0.40642	-1.60967
	setup	CK (R)	0.26386	0.42203	1.63551

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)	0.24052	0.26164	0.85532
	removal	CK (R)	-0.03256	-0.03456	-0.07515
	hold	SN (R)	-0.25535	-0.47381	-1.76733
	setup	SN (R)	0.29460	0.54092	3.30019
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24029	0.26180	0.85847
	removal	CK (R)	-0.03021	-0.03456	-0.07615
	hold	SN (R)	-0.25068	-0.46548	-1.72092
	setup	SN (R)	0.29472	0.52927	3.20703

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)	0.24052	0.26164	0.85532
	removal	CK (R)	-0.03256	-0.03456	-0.07515
	hold	SN (R)	-0.25540	-0.47381	-1.76733
	hold	SN (R)	-0.25535	-0.47774	-1.78100
	setup	SN (R)	0.29460	0.53618	3.13126
	setup	SN (R)	0.29108	0.54092	3.30019
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24029	0.26180	0.85847
	removal	CK (R)	-0.03021	-0.03456	-0.07615
	hold	SN (R)	-0.25100	-0.46548	-1.72092
	hold	SN (R)	-0.25068	-0.46828	-1.73091
	setup	SN (R)	0.29472	0.52585	3.03902
	setup	SN (R)	0.27756	0.52927	3.20703

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 ()	0.22347	0.60303	13.33370
	min_pulse_width	RN ()	0.22572	0.60303	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.22122	0.60303	13.33370
	min_pulse_width	RN ()	0.21673	0.60303	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)	0.08712	0.12809	2.43091
	removal	CK (R)	-0.03654	-0.09543	-0.40473
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.08704	0.12830	2.32399
	removal	CK (R)	-0.03654	-0.09543	-0.40473

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)	0.08712	0.12809	2.43091
	removal	CK (R)	-0.03654	-0.09543	-0.40473
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.08704	0.12830	2.32399
	removal	CK (R)	-0.03654	-0.09543	-0.40473

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	SN ()	0.25042	0.60303	13.33370
	min_pulse_width	SN ()	0.25042	0.60303	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.25042	0.60303	13.33370
	min_pulse_width	SN ()	0.23694	0.60303	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.22122	0.60303	13.33370
	min_pulse_width	CK ()	0.26165	0.60303	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.21449	0.60303	13.33370
	min_pulse_width	CK ()	0.25940	0.60303	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.44357	0.60303	13.33370
	min_pulse_width	CK ()	0.23470	0.60303	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.44357	0.60303	13.33370
	min_pulse_width	CK ()	0.23470	0.60303	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	0.01684	0.01611	0.02535
	RN	0.03049	0.02988	0.03051
	SN	-0.00167	-0.09432	-1.38594
	SN	0.03426	0.03298	0.03507
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01540	0.01456	0.02695
	RN	0.02903	0.02833	0.03227
	SN	-0.00167	-0.07707	-0.98975
	SN	0.03280	0.03145	0.03641

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	0.01816	0.01709	0.01557
	RN	-0.00167	-0.09432	-1.38593
	RN	0.03586	0.03492	0.03486
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01674	0.01591	0.02045
	RN	-0.00167	-0.07707	-0.98973
	RN	0.03442	0.03370	0.04005

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	0.01801	0.01699	0.01506
	RN	-0.00167	-0.09459	-1.39075
	RN	0.03574	0.03481	0.03448
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01654	0.01570	0.02049
	RN	-0.00167	-0.07693	-0.98310
	RN	0.03427	0.03355	0.03955

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	0.01669	0.01596	0.02534
	RN	0.03033	0.02973	0.03033
	SN	-0.00167	-0.09459	-1.39226
	SN	0.03410	0.03283	0.03465
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01527	0.01445	0.02660
	RN	0.02891	0.02820	0.03214
	SN	-0.00167	-0.07693	-0.98666
	SN	0.03268	0.03137	0.03655

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	-0.00440	-0.00442	-0.00445
	(!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)	0.02098	0.02045	0.04064
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00855	0.00805	0.02830
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00854	0.00806	0.02841
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00861	0.00814	0.02837
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00440	-0.00442	-0.00444
	(!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)	0.02098	0.02045	0.04064
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00855	0.00806	0.02830
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00854	0.00806	0.02841
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00861	0.00814	0.02837

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	0.00500	0.00496	0.00495
	(!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)	0.03199	0.03180	0.05352
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01369	0.01377	0.03552
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01414	0.01407	0.03561
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01366	0.01370	0.03548
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00500	0.00497	0.00495
	(!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)	0.03198	0.03179	0.05352
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01368	0.01376	0.03551
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01414	0.01407	0.03561
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01365	0.01370	0.03548

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)	0.00412	0.00435	0.03700
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01659	0.01656	0.04976
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)	0.00412	0.00437	0.03701
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01660	0.01657	0.04977

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)	0.01251	0.01414	0.04923
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02723	0.02812	0.06324
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)	0.01250	0.01413	0.04922
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02722	0.02811	0.06324

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)	-0.01012	-0.01019	-0.01025
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00859	-0.01026	-0.01049
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00918	-0.01003	-0.01012
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00785	0.00758	0.02846
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)	-0.01012	-0.01018	-0.01025
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00857	-0.01024	-0.01047
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00917	-0.01002	-0.01011
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00786	0.00760	0.02847

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)	0.01067	0.01087	0.01072
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01094	0.01105	0.01101
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01058	0.01068	0.01065
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02150	0.02125	0.04203
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)	0.01067	0.01087	0.01072
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01093	0.01104	0.01100
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01058	0.01068	0.01065
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02150	0.02121	0.04203

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)	-0.00088	-0.00082	0.03167
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00877	0.00847	0.04195
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00830	0.00806	0.04172
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00118	-0.00102	0.03106
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00596	0.00610	0.06664
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00087	-0.00082	0.03167
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00876	0.00847	0.04195
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00830	0.00805	0.04171
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00117	-0.00101	0.03107
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00596	0.00610	0.06665

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)	0.04607	0.04629	0.08407
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01822	0.01979	0.05459
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03250	0.03331	0.06786
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03259	0.03340	0.06781
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04427	0.04633	0.10646
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02145	0.02283	0.05693
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02449	0.02715	0.09161
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04607	0.04630	0.08407
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01822	0.01980	0.05459
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03251	0.03332	0.06786
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03259	0.03341	0.06781
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04426	0.04633	0.10645
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02145	0.02283	0.05694
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02448	0.02715	0.09161

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00598	0.00984	0.01713	2.10013	2.11344
sky130_osu_sc_18T_ms__dffs_l	0.00598	0.00984	0.01713	1.54863	1.54490

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	23.32420	37.25140
sky130_osu_sc_18T_ms__dffs_l	0.00000	23.65270	37.57990

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)	0.33679	1.80032	19.62080
	QN->Q (FR)	0.04194	0.88220	11.58140
	SN->Q (FR)	0.23446	1.70836	18.73980
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.33476	1.92333	19.25970
	QN->Q (FR)	0.04113	0.87850	10.71870
	SN->Q (FR)	0.23358	1.82325	18.33480

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RF)	0.52906	2.09823	20.94850
	QN->Q (RF)	0.04487	0.97284	12.76250
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.51768	2.19634	20.27010
	QN->Q (RF)	0.04745	1.03224	12.61910

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RR)	0.46202	1.19300	8.45181
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.44594	1.17376	7.67592

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)	0.28379	0.99832	8.53179
	SN->QN (FF)	0.18152	0.90681	7.65049
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.27962	1.06172	8.63763
	SN->QN (FF)	0.17813	0.96201	7.71567

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)	-0.10013	-0.10927	-0.09450
	setup	CK (R)	0.24667	0.26403	0.63789
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09707	-0.10801	-0.09163
	setup	CK (R)	0.24626	0.26460	0.64116

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)	-0.17561	-0.38208	-1.54098
	setup	CK (R)	0.24846	0.39913	1.56630
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.17544	-0.38159	-1.53961
	setup	CK (R)	0.24929	0.39931	1.56621

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)	-0.10013	-0.10927	-0.09450
	setup	CK (R)	0.24667	0.26403	0.63789
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09707	-0.10801	-0.09163
	setup	CK (R)	0.24626	0.26460	0.64116

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)	-0.17561	-0.38208	-1.54098
	setup	CK (R)	0.24846	0.39913	1.56630
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.17544	-0.38159	-1.53961
	setup	CK (R)	0.24929	0.39931	1.56621

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)	0.09088	0.12500	1.36855
	removal	CK (R)	-0.03976	-0.09042	-0.51401
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.09215	0.12500	1.27635
	removal	CK (R)	-0.03976	-0.09042	-0.51401

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)	0.09088	0.12500	1.36855
	removal	CK (R)	-0.03976	-0.09042	-0.51401
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.09215	0.12500	1.27635
	removal	CK (R)	-0.03976	-0.09042	-0.51401

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 ()	0.14711	0.60303	13.33370
	min_pulse_width	SN ()	0.14711	0.60303	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.14711	0.60303	13.33370
	min_pulse_width	SN ()	0.13812	0.60303	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 ()	0.15609	0.60303	13.33370
	min_pulse_width	CK ()	0.26165	0.60303	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.15160	0.60303	13.33370
	min_pulse_width	CK ()	0.25267	0.60303	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	CK ()	0.33352	0.60303	13.33370
	min_pulse_width	CK ()	0.22347	0.60303	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.33352	0.60303	13.33370
	min_pulse_width	CK ()	0.22347	0.60303	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	0.01331	0.01194	0.01207
	SN	-0.00167	-0.09260	-1.34408
	SN	0.02857	0.02689	0.02171
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01176	0.01100	0.02337
	SN	-0.00167	-0.07713	-0.99111
	SN	0.02701	0.02597	0.03267

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	0.01552	0.01426	0.01012
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01397	0.01311	0.01838

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	0.01533	0.01408	0.00975
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01375	0.01292	0.01804

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	0.01320	0.01183	0.01211
	SN	-0.00167	-0.09296	-1.35245
	SN	0.02845	0.02676	0.02098
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01167	0.01094	0.02334
	SN	-0.00167	-0.07702	-0.98864
	SN	0.02691	0.02586	0.03231

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	-0.00439	-0.00441	-0.00443
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01542	0.01490	0.03618
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00727	0.00678	0.02724
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00439	-0.00441	-0.00443
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01542	0.01490	0.03618
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00727	0.00678	0.02724

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	0.00510	0.00507	0.00505
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02683	0.02667	0.04884
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01314	0.01322	0.03522
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00510	0.00507	0.00505
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02684	0.02667	0.04884
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01314	0.01322	0.03523

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)	-0.00736	-0.00743	-0.00742
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00597	0.00588	0.02558
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)	-0.00736	-0.00743	-0.00742
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00597	0.00588	0.02558

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)	0.00780	0.00779	0.00778
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01465	0.01497	0.03662
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)	0.00780	0.00779	0.00778
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01465	0.01498	0.03663

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)	-0.00095	-0.00089	0.03162
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00121	-0.00104	0.03105
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00462	0.00480	0.06597
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00095	-0.00089	0.03163
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00121	-0.00104	0.03105
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00462	0.00480	0.06597

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)	0.04047	0.04062	0.07931
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01813	0.01970	0.05452
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03896	0.04115	0.10136
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02152	0.02291	0.05705
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02385	0.02659	0.09147
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.04047	0.04062	0.07931
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01813	0.01972	0.05452
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03897	0.04114	0.10137
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02152	0.02292	0.05705
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02385	0.02659	0.09148

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00613	0.01711	2.17195	2.18835
sky130_osu_sc_18T_ms__dff_l	0.00613	0.01711	1.55840	1.55330

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	20.25080	24.55140
sky130_osu_sc_18T_ms__dff_l	0.00000	20.57920	24.87990

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)	0.32034	1.77261	19.63990
	QN->Q (FR)	0.04019	0.86736	11.49130
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.32598	1.93053	19.46410
	QN->Q (FR)	0.04184	0.89234	10.92620

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RF)	0.42793	1.95922	20.84490
	QN->Q (RF)	0.04179	0.93261	12.32500
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.43124	2.10804	20.43380
	QN->Q (RF)	0.04755	1.03242	12.67000

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RR)	0.36895	1.07200	8.41820
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.36431	1.07696	7.69050

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)	0.26976	0.97774	8.48736
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.27099	1.05948	8.69129

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)	-0.09631	-0.11360	-0.12238
	setup	CK (R)	0.22737	0.24601	0.65378
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.10003	-0.11360	-0.12242
	setup	CK (R)	0.22728	0.24552	0.65639

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)	-0.15645	-0.38309	-1.54993
	setup	CK (R)	0.18942	0.39950	1.58002
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.15641	-0.38436	-1.55369
	setup	CK (R)	0.18942	0.39950	1.58002

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 ()	0.15609	0.60303	13.33370
	min_pulse_width	CK ()	0.23021	0.60303	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.15160	0.60303	13.33370
	min_pulse_width	CK ()	0.22572	0.60303	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 ()**	0.31331	0.60303	13.33370
	min_pulse_width	**CK ()**	0.15160	0.60303	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.31331	0.60303	13.33370
	min_pulse_width	**CK ()**	0.14935	0.60303	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	0.01403	0.01336	0.02370
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01259	0.01183	0.02474

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	0.01562	0.01463	0.01388
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01423	0.01329	0.01692

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	0.01550	0.01451	0.01457
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01408	0.01313	0.01686

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	0.01391	0.01324	0.02362
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01250	0.01177	0.02471

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	-0.00353	-0.00433	-0.00448
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01482	0.01441	0.03612
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00353	-0.00433	-0.00447
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01483	0.01442	0.03612

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	0.00491	0.00496	0.00495
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02762	0.02745	0.05004
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00492	0.00496	0.00495
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02762	0.02745	0.05005

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)	-0.00096	-0.00089	0.03164
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00131	-0.00114	0.03097
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00096	-0.00089	0.03164
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00131	-0.00113	0.03098

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)	0.01806	0.01965	0.05447
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03991	0.04006	0.07889
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03961	0.04193	0.10293
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02133	0.02271	0.05686
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01807	0.01965	0.05447
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03992	0.04007	0.07890
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03962	0.04194	0.10283
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02133	0.02272	0.05687

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00599	2.04337
sky130_osu_sc_18T_ms__inv_10	0.05682	18.33245
sky130_osu_sc_18T_ms__inv_2	0.01155	4.03753
sky130_osu_sc_18T_ms__inv_3	0.01724	5.79887
sky130_osu_sc_18T_ms__inv_4	0.02284	7.79775
sky130_osu_sc_18T_ms__inv_6	0.03425	11.37745
sky130_osu_sc_18T_ms__inv_8	0.04554	15.01748
sky130_osu_sc_18T_ms__inv_l	0.00451	1.51443

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	3.05465	5.96489
sky130_osu_sc_18T_ms__inv_10	0.00000	29.06790	57.42600
sky130_osu_sc_18T_ms__inv_2	0.00000	5.81367	11.48540
sky130_osu_sc_18T_ms__inv_3	0.00000	8.86824	17.45010
sky130_osu_sc_18T_ms__inv_4	0.00000	11.62730	22.97060
sky130_osu_sc_18T_ms__inv_6	0.00000	17.44080	34.45580
sky130_osu_sc_18T_ms__inv_8	0.00000	23.25440	45.94100
sky130_osu_sc_18T_ms__inv_l	0.00000	3.21887	6.33105

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)**	0.03848	0.79879	10.43420
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.05313	0.52821	10.30020
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.03161	0.69124	10.41110
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.03463	0.64253	10.36560
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.03548	0.60813	10.37110
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.03969	0.56451	10.29510
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.04602	0.54146	10.30700
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.03913	0.82131	9.96941

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)**	0.03858	0.84630	10.98600
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.05798	0.57299	10.65880
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.03192	0.73405	10.94540
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.03462	0.68784	10.90830
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.03468	0.65268	10.91490
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.04269	0.61269	10.81550
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.05016	0.59057	10.79390
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.04369	0.94096	11.49870

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	0.00693	0.00709	0.01302
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.06074	0.07205	0.12527
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01250	0.01366	0.02491
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01910	0.02235	0.03779
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02467	0.02855	0.04986
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03666	0.04300	0.07476
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04867	0.05719	0.09997
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00525	0.00560	0.00920

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	-0.00148	-0.00111	0.00152
sky130_osu_sc_18T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.02383	-0.01822	0.01070
sky130_osu_sc_18T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00473	-0.00380	0.00167
sky130_osu_sc_18T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00629	-0.00500	0.00356
sky130_osu_sc_18T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00961	-0.00712	0.00368
sky130_osu_sc_18T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01479	-0.01055	0.00578
sky130_osu_sc_18T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01973	-0.01542	0.00788
sky130_osu_sc_18T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00098	-0.00070	0.00138

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.13423	0.13404	0.01214	0.12549

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	6.34991	6.50159

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)	-	0.02551	0.25346	1.50888
	A1->Y (RR)	-	0.02714	0.25513	1.51632
	S0->Y (RR)	(!A0 * A1)	0.07883	0.36918	1.59710
	S0->Y (FR)	(A0 * !A1)	0.05367	0.32522	1.37703

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)	-	0.02206	0.25207	1.52913
	A1->Y (FF)	-	0.02104	0.25058	1.52209
	S0->Y (FF)	(!A0 * A1)	0.09035	0.32070	0.69782
	S0->Y (RF)	(A0 * !A1)	0.04480	0.37667	2.22439

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	-	-0.00697	-0.00697	-0.00698
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00490	-0.00490	-0.00490
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00765	0.00959	0.04542
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00505	-0.00441	0.02930

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	-	0.00698	0.00699	0.00699
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00517	0.00518	0.00518
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00147	0.00253	0.03675
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01840	0.02004	0.05516

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)	-0.00171	-0.00171	-0.00171

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)	0.00181	0.00181	0.00181

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)	-0.00208	-0.00207	-0.00207

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)	0.00208	0.00207	0.00207

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)	-0.00182	-0.00112	0.03300
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00177	-0.00113	0.03330

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)	0.01388	0.01568	0.05082
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01221	0.01427	0.04988

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00600	0.00597	1.28281
sky130_osu_sc_18T_ms__nand2_l	0.00452	0.00450	0.84606

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	2.99004	11.48510
sky130_osu_sc_18T_ms__nand2_l	0.00000	3.17873	12.35400

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)	0.03963	0.69517	8.06460
	B->Y (FR)	0.04627	0.69769	8.01615
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.03993	0.68543	7.27358
	B->Y (FR)	0.04659	0.68991	7.25530

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)	0.06151	0.97943	11.30960
	B->Y (RF)	0.06964	0.94630	10.78690
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.07157	1.07584	11.15710
	B->Y (RF)	0.07979	1.04451	10.60960

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	0.00736	0.00777	0.01466
	B	0.00000	0.00000	0.00000
	B	0.00919	0.00949	0.01655
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00553	0.00591	0.01095
	B	0.00000	0.00000	0.00000
	B	0.00684	0.00715	0.01230

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	-0.00085	-0.00064	0.00250
	B	0.00000	0.00000	0.00000
	B	-0.00078	-0.00091	0.00187
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00053	-0.00043	0.00226
	B	0.00000	0.00000	0.00000
	B	-0.00048	-0.00058	0.00181

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)	-0.00513	-0.00517	-0.00519
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00366	-0.00370	-0.00371

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)	0.00518	0.00525	0.00521
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00371	0.00375	0.00373

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)	-0.00487	-0.00488	-0.00487
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00347	-0.00349	-0.00348

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)	0.00493	0.00494	0.00489
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00353	0.00353	0.00349

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00599	0.00631	1.08526
sky130_osu_sc_18T_ms__nor2_l	0.00444	0.00478	0.80452

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	2.48087	5.96402
sky130_osu_sc_18T_ms__nor2_l	0.00000	2.77400	6.32966

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)	0.08161	0.91827	9.78962
	B->Y (FR)	0.06027	0.91459	10.05510
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.08198	0.95806	9.42921
	B->Y (FR)	0.06541	0.97115	9.94157

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)	0.05529	0.72174	7.94195
	B->Y (RF)	0.04145	0.70182	7.91685
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.06017	0.78643	8.22037
	B->Y (RF)	0.04675	0.76962	8.19837

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	0.01023	0.01024	0.01460
	B	0.00000	0.00000	0.00000
	B	0.00750	0.00797	0.01528
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00731	0.00732	0.01063
	B	0.00000	0.00000	0.00000
	B	0.00561	0.00560	0.01084

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	0.00131	0.00131	0.00506
	B	0.00000	0.00000	0.00000
	B	-0.00114	-0.00080	0.00290
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00090	0.00091	0.00399
	B	0.00000	0.00000	0.00000
	B	-0.00070	-0.00042	0.00249

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)	-0.00371	-0.00452	-0.00466
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00266	-0.00315	-0.00323

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)	0.00477	0.00481	0.00480
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00335	0.00339	0.00337

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)	-0.00210	-0.00214	-0.00211
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00155	-0.00157	-0.00155

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)	0.00224	0.00226	0.00216
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00166	0.00167	0.00160

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00605	0.00612	0.00500	1.07520

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	3.71242	12.29450

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)	0.08082	0.93551	10.05670
	A1->Y (FR)	0.10620	0.94601	9.78860
	B0->Y (FR)	0.04946	0.74161	8.21222

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)	0.08601	0.94372	10.05680
	A1->Y (RF)	0.11094	0.94963	9.82406
	B0->Y (RF)	0.06592	0.97076	10.69370

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	0.01018	0.01049	0.01673
	A1	0.00000	0.00000	0.00000
	A1	0.01289	0.01283	0.01606
	B0	0.00878	0.00923	0.01500

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	0.00051	0.00032	0.00308
	A1	0.00000	0.00000	0.00000
	A1	0.00289	0.00250	0.00529
	B0	0.00098	0.00123	0.00445

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)	-0.00205	-0.00208	-0.00206
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00470	-0.00475	-0.00472
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00479	-0.00481	-0.00480

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)	0.00229	0.00232	0.00222
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00470	0.00475	0.00472
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00481	0.00485	0.00481

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)	-0.00359	-0.00441	-0.00454
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00466	-0.00472	-0.00469
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00475	-0.00477	-0.00476

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)	0.00476	0.00480	0.00480
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00466	0.00473	0.00469
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00477	0.00482	0.00477

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)	-0.00370	-0.00372	-0.00381

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)	0.00381	0.00388	0.00383

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00590	0.00616	0.00630	0.00618	1.07234

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	3.53907	11.49320

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)	0.11024	0.95013	9.75788
	A1->Y (FR)	0.09445	0.93918	10.02460
	B0->Y (FR)	0.06892	0.92336	10.01180
	B1->Y (FR)	0.09085	0.92834	9.74699

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)	0.15948	1.03882	10.26700
	A1->Y (RF)	0.12372	0.99015	10.11700
	B0->Y (RF)	0.10605	1.01555	10.72520
	B1->Y (RF)	0.14360	1.07212	10.97170

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	0.01696	0.01688	0.02064
	A1	0.01422	0.01449	0.02069
	B0	0.01070	0.01107	0.01729
	B1	0.01353	0.01352	0.01729

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00475	0.00434	0.00707
	A1	0.00258	0.00226	0.00492
	B0	-0.00038	-0.00022	0.00322
	B1	0.00476	0.00455	0.00769

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)	-0.00370	-0.00451	-0.00466
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00368	-0.00449	-0.00463
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00467	-0.00470	-0.00470
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00476	-0.00477	-0.00477

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)	0.00477	0.00482	0.00480
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00479	0.00484	0.00483
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00467	0.00470	0.00470
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00478	0.00482	0.00478

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)	-0.00209	-0.00213	-0.00209
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00206	-0.00211	-0.00207
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00466	-0.00470	-0.00468
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00475	-0.00478	-0.00476

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)	0.00223	0.00225	0.00215
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00225	0.00227	0.00217
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00466	0.00470	0.00468
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00477	0.00481	0.00477

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)	-0.00208	-0.00212	-0.00208
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00205	-0.00210	-0.00206
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00507	-0.00512	-0.00510
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00500	-0.00504	-0.00515

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)	0.00222	0.00224	0.00214
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00224	0.00225	0.00216
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00510	0.00518	0.00510
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00515	0.00525	0.00518

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)	-0.00365	-0.00447	-0.00460
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00363	-0.00445	-0.00458
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00513	-0.00518	-0.00516
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00505	-0.00510	-0.00520

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)	0.00472	0.00476	0.00475
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00474	0.00478	0.00477
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00517	0.00519	0.00516
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00521	0.00527	0.00524

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00632	0.00613	2.15060
sky130_osu_sc_18T_ms__or2_2	0.00633	0.00613	4.16342
sky130_osu_sc_18T_ms__or2_4	0.00633	0.00614	8.11687
sky130_osu_sc_18T_ms__or2_8	0.00634	0.00615	15.34693
sky130_osu_sc_18T_ms__or2_l	0.00485	0.00461	1.55731

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	4.08469	6.10842
sky130_osu_sc_18T_ms__or2_2	0.00000	5.46300	11.62750
sky130_osu_sc_18T_ms__or2_4	0.00000	8.44083	23.11300
sky130_osu_sc_18T_ms__or2_8	0.00000	14.39640	46.08380
sky130_osu_sc_18T_ms__or2_l	0.00000	4.44094	6.43634

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)	0.11132	0.82209	8.15887
	B->Y (RR)	0.09360	0.76726	8.00609
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.12279	0.75942	8.19619
	B->Y (RR)	0.10472	0.71170	8.04514
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.15743	0.77216	8.57076
	B->Y (RR)	0.13894	0.73558	8.43478
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.22295	0.84688	8.96463
	B->Y (RR)	0.20388	0.81937	8.84280
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.11775	0.84570	7.61292
	B->Y (RR)	0.09968	0.79427	7.44668

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)	0.16986	0.83018	7.56779
	B->Y (FF)	0.14273	0.79583	7.51491
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.20122	0.79585	7.62162
	B->Y (FF)	0.17416	0.77597	7.58015
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.28291	0.86142	8.05523
	B->Y (FF)	0.25605	0.85488	8.02577
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.45128	1.03677	8.41382
	B->Y (FF)	0.42449	1.02928	8.42957
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.17417	0.90623	7.80910
	B->Y (FF)	0.15043	0.88896	7.82397

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	0.00800	0.00814	0.02857
	B	0.00000	0.00000	0.00000
	B	0.00567	0.00615	0.03166
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01358	0.01404	0.03441
	B	0.00000	0.00000	0.00000
	B	0.01121	0.01218	0.03671
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02590	0.02686	0.04688
	B	0.00000	0.00000	0.00000
	B	0.02344	0.02503	0.04824
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05215	0.05307	0.07384
	B	0.00000	0.00000	0.00000
	B	0.04957	0.05185	0.07498
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00587	0.00596	0.02173
	B	0.00000	0.00000	0.00000
	B	0.00430	0.00468	0.02322

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	0.01617	0.01653	0.03777
	B	0.00000	0.00000	0.00000
	B	0.01316	0.01506	0.04597
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01983	0.02077	0.04150
	B	0.00000	0.00000	0.00000
	B	0.01685	0.01912	0.04906
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03003	0.03083	0.05089
	B	0.00000	0.00000	0.00000
	B	0.02704	0.02897	0.05771
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05554	0.05109	0.07007
	B	0.00000	0.00000	0.00000
	B	0.05258	0.04850	0.07613
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01207	0.01230	0.02819
	B	0.00000	0.00000	0.00000
	B	0.01002	0.01131	0.03343

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)	-0.00370	-0.00454	-0.00467
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00370	-0.00454	-0.00467
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00370	-0.00454	-0.00467
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00369	-0.00454	-0.00467
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00265	-0.00316	-0.00324

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)	0.00479	0.00485	0.00482
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00479	0.00485	0.00482
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00479	0.00480	0.00482
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00480	0.00480	0.00483
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00336	0.00339	0.00338

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)	-0.00211	-0.00213	-0.00211
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00211	-0.00213	-0.00211
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00211	-0.00213	-0.00211
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00210	-0.00213	-0.00211
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00157	-0.00159	-0.00158

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)	0.00227	0.00228	0.00217
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00227	0.00228	0.00217
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00227	0.00228	0.00217
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00228	0.00228	0.00217
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00171	0.00171	0.00163

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00630	0.00785	1.08546
sky130_osu_sc_18T_ms__tbufi_l	0.00479	0.00600	0.80173

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	3.21278	11.92870
sky130_osu_sc_18T_ms__tbufi_l	0.00000	3.33888	12.66040

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)	0.05795	0.90867	10.04380
	OE->Y (FR)	0.06496	0.39529	4.68897
	OE->Y (RR)	0.11989	0.89369	7.82648
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.06318	0.96920	9.92181
	OE->Y (FR)	0.06256	0.39497	4.68872
	OE->Y (RR)	0.12345	0.95953	7.73706

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)	0.06053	0.92025	10.22170
	OE->Y (FF)	0.06630	0.39520	4.68896
	OE->Y (RF)	0.05494	0.87793	9.65192
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.07140	1.05373	10.79170
	OE->Y (FF)	0.06357	0.39495	4.68870
	OE->Y (RF)	0.06592	1.00993	10.21300

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	0.00724	0.00774	0.01405
	OE	0.00000	0.00000	0.00000
	OE	0.00746	0.00818	0.03952
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00549	0.00547	0.01004
	OE	0.00000	0.00000	0.00000
	OE	0.00525	0.00584	0.02879

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	-0.00099	-0.00071	0.00257
	OE	0.00000	0.00000	0.00000
	OE	0.00504	0.00577	0.04034
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00051	-0.00028	0.00224
	OE	0.00000	0.00000	0.00000
	OE	0.00359	0.00418	0.02904

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)	-0.00349	-0.00348	-0.00350
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00296	-0.00302	-0.00297
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00264	-0.00265	-0.00265
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00229	-0.00232	-0.00230

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)	0.00349	0.00348	0.00350
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00306	0.00309	0.00302
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00264	0.00265	0.00265
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00237	0.00239	0.00234

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)	0.00308	0.00397	0.03867
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00256	0.00343	0.03811
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00210	0.00276	0.02782
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00173	0.00241	0.02744

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)	0.00834	0.00985	0.04539
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00814	0.00979	0.04535
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00640	0.00745	0.03299
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00626	0.00739	0.03299

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00630	0.01011	1.08550
sky130_osu_sc_18T_ms__tnbufi_l	0.00479	0.00742	0.80173

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	5.15297	6.16232
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	5.41371	6.48340

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)	0.05843	0.90893	10.04410
	OE->Y (RR)	0.04677	0.39685	4.69067
	OE->Y (FR)	0.07603	0.91230	9.75274
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.06373	0.96927	9.92182
	OE->Y (RR)	0.04972	0.39712	4.69086
	OE->Y (FR)	0.07719	0.95263	9.38614

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)	0.05971	0.92312	10.22170
	OE->Y (RF)	0.04626	0.39686	4.69064
	OE->Y (FF)	0.08845	0.71404	6.19517
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.07041	1.05335	10.79130
	OE->Y (RF)	0.04927	0.39713	4.69086
	OE->Y (FF)	0.09816	0.84119	6.68581

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	0.00723	0.00773	0.01405
	OE	0.00000	0.00000	0.00000
	OE	0.01779	0.02005	0.05675
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00547	0.00545	0.01003
	OE	0.00000	0.00000	0.00000
	OE	0.01299	0.01452	0.04089

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	-0.00134	-0.00103	0.00224
	OE	0.00000	0.00000	0.00000
	OE	0.01559	0.01792	0.05255
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00087	-0.00063	0.00188
	OE	0.00000	0.00000	0.00000
	OE	0.01148	0.01301	0.03775

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)	-0.00308	-0.00308	-0.00309
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00250	-0.00255	-0.00251
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00227	-0.00227	-0.00227
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00184	-0.00188	-0.00185

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)	0.00308	0.00308	0.00309
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00269	0.00271	0.00266
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00227	0.00227	0.00227
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00202	0.00204	0.00199

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)	-0.00540	-0.00503	0.03052
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00565	-0.00514	0.03049
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00380	-0.00341	0.02219
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00398	-0.00351	0.02216

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)	0.01346	0.01590	0.05238
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01308	0.01553	0.05202
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00991	0.01161	0.03781
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00965	0.01131	0.03756

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.01247	0.01152	1.10629

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__xnor2_l	0.00000	10.62490	17.61660

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_1	A->Y (RR)	B	0.15053	0.94685	8.03037
	A->Y (FR)	!B	0.07635	0.93513	10.14340
	B->Y (RR)	A	0.11969	0.91496	8.04585
	B->Y (FR)	!A	0.10389	0.94473	9.89561

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_1	A->Y (FF)	B	0.17116	0.87532	6.78440
	A->Y (RF)	!B	0.08613	0.92634	9.99401
	B->Y (FF)	A	0.13782	0.84434	6.76689
	B->Y (RF)	!A	0.11331	0.95899	10.01680

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	0.00754	0.00796	0.03863
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01728	0.01920	0.06064
	B	A	0.00000	0.00000	0.00000
	B	A	0.00220	0.00308	0.03767
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01945	0.02119	0.06008

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	0.02193	0.02280	0.05776
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00490	0.00534	0.04185
	B	A	0.00000	0.00000	0.00000
	B	A	0.01968	0.02170	0.05747
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00630	0.00660	0.04310

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.01246	0.01156	1.10364

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	10.62490	18.00440

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	0.14016	0.93054	8.05086
	A->Y (FR)	B	0.09525	0.93595	9.93253
	B->Y (RR)	!A	0.12213	0.91822	8.05678
	B->Y (FR)	A	0.10335	0.94538	9.92522

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	0.13895	0.83016	6.52333
	A->Y (RF)	B	0.09490	0.97180	10.35400
	B->Y (FF)	!A	0.13130	0.82769	6.58909
	B->Y (RF)	A	0.10643	0.93947	9.82021

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	0.02045	0.02231	0.06205
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00342	0.00331	0.03731
	B	A	0.00000	0.00000	0.00000
	B	A	0.02122	0.02314	0.06253
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00180	0.00257	0.03719

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	0.00457	0.00487	0.04236
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02172	0.02367	0.05771
	B	A	0.00000	0.00000	0.00000
	B	A	0.00459	0.00482	0.04160
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01986	0.02207	0.05817

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.68619
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	219719.00000	439438.00000
sky130_osu_sc_18T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__ant	0.00000	0.00000	0.00000
	-0.00211	0.07399	0.88722

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
	3.82325	3.59874	1.05807