sky130_osu_sc_18T_ms_tt_1P44_25C.ccs Library

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

SKY130_OSU_SC_18T_MS__ADDFx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT		
A	B	CI	CO	CON	S
0	0	0	0	1	0
0	0	1	0	1	1
0	1	0	0	1	1
0	1	1	1	0	0
1	0	0	0	1	1
1	0	1	1	0	0
1	1	0	1	0	0
1	1	1	1	0	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01994	0.02002	0.01528	1.94943	0.87607	1.90432
sky130_osu_sc_18T_ms__addf_l	0.01994	0.02001	0.01527	1.34227	0.88097	1.33580

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.17017	0.22683
sky130_osu_sc_18T_ms__addf_l	0.00000	0.15247	0.20913

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)	0.21207	2.20578	28.71490
	B->CO (RR)	0.18741	2.10077	27.48630
	CI->CO (RR)	0.20171	2.21808	29.03300
	CON->CO (FR)	0.03751	0.88765	11.83230
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.21425	2.05658	23.47180
	B->CO (RR)	0.19019	1.96639	22.60960
	CI->CO (RR)	0.20378	2.06957	23.80770
	CON->CO (FR)	0.04332	0.97046	11.91170

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)	0.29914	2.84795	36.79000
	B->CO (FF)	0.27217	2.73802	35.44930
	CI->CO (FF)	0.26419	2.78206	36.47490
	CON->CO (RF)	0.03254	0.76867	10.21170
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.29334	2.54289	28.65310
	B->CO (FF)	0.26745	2.45135	27.71610
	CI->CO (FF)	0.25829	2.47743	28.36370
	CON->CO (RF)	0.03527	0.79746	9.79932

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)	0.20803	1.22639	11.86080
	B->CON (FR)	0.18122	1.16446	11.51260
	CI->CON (FR)	0.17300	1.16267	11.60940
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.19815	1.21866	11.89070
	B->CON (FR)	0.17211	1.15713	11.54000
	CI->CON (FR)	0.16314	1.15175	11.63870

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)	0.12807	0.84511	8.44514
	B->CON (RF)	0.12072	0.82017	8.35793
	CI->CON (RF)	0.11771	0.85756	8.82250
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.12337	0.84176	8.46515
	B->CON (RF)	0.11644	0.81761	8.37629
	CI->CON (RF)	0.11297	0.85417	8.84230

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)	0.42883	2.65469	28.48700
	B->S (-R)	0.43990	2.64051	27.91760
	CI->S (-R)	0.39101	2.58160	28.15720
	CON->S (RR)	0.11709	0.86416	8.28255
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.41185	2.43882	23.64470
	B->S (-R)	0.42322	2.43691	23.33140
	CI->S (-R)	0.37383	2.36688	23.33180
	CON->S (RR)	0.11772	0.92209	8.18979

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)	0.35589	2.07473	21.40910
	B->S (-F)	0.35236	1.98152	20.55390
	CI->S (-F)	0.34420	2.08080	21.70590
	CON->S (FF)	0.14653	0.87855	7.62926
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.33906	1.89355	17.72860
	B->S (-F)	0.33496	1.81587	17.15440
	CI->S (-F)	0.32708	1.90177	18.05550
	CON->S (FF)	0.13599	0.90021	7.29025

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	0.00325	0.00308	0.00403
	B	0.00408	0.00404	0.00516
	CI	0.00413	0.00428	0.00572
sky130_osu_sc_18T_ms__addf_l	A	0.00262	0.00237	0.00296
	B	0.00345	0.00333	0.00394
	CI	0.00350	0.00356	0.00445

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01146	0.01150	0.01287
	B	0.01132	0.01152	0.01299
	CI	0.00993	0.01032	0.01183
sky130_osu_sc_18T_ms__addf_l	A	0.01084	0.01082	0.01164
	B	0.01070	0.01085	0.01170
	CI	0.00930	0.00964	0.01058

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01144	0.01143	0.01181
	B	0.01130	0.01146	0.01185
	CI	0.00991	0.01024	0.01034
sky130_osu_sc_18T_ms__addf_l	A	0.01082	0.01078	0.01117
	B	0.01068	0.01082	0.01120
	CI	0.00929	0.00959	0.00966

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00320	0.00301	0.00332
	B	0.00403	0.00393	0.00430
	CI	0.00412	0.00421	0.00476
sky130_osu_sc_18T_ms__addf_l	A	0.00258	0.00233	0.00263
	B	0.00341	0.00325	0.00360
	CI	0.00349	0.00352	0.00407

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01145	0.01149	0.01278
	B	0.01132	0.01151	0.01293
	CI	0.00993	0.01031	0.01174
sky130_osu_sc_18T_ms__addf_l	A	0.01084	0.01082	0.01161
	B	0.01070	0.01085	0.01168
	CI	0.00930	0.00964	0.01050

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02387	0.02405	0.02446
	B	0.02142	0.02112	0.02366
	CI	0.01938	0.01942	0.01994
sky130_osu_sc_18T_ms__addf_l	A	0.02301	0.02307	0.02343
	B	0.02058	0.02017	0.02287
	CI	0.01855	0.01853	0.01905

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT		
A	B	CO	CON	S
0	0	0	1	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00987	0.01074	1.91943	0.93842	1.95280
sky130_osu_sc_18T_ms__addh_l	0.00987	0.01074	1.16021	0.92205	1.17216

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.19623	0.22648
sky130_osu_sc_18T_ms__addh_l	0.00000	0.13295	0.17577

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)	0.14374	0.88599	8.16135
	B->CO (RR)	0.14917	0.89260	8.29902
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.14322	0.96493	8.00912
	B->CO (RR)	0.14871	0.97429	8.15289

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)	0.12173	0.83776	7.57130
	B->CO (FF)	0.12893	0.85144	7.61854
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.12062	0.87938	7.19190
	B->CO (FF)	0.12765	0.89365	7.24086

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	0.19129	0.75516	4.69055
	A->CON (FR)	!B	0.11811	1.09462	11.60600
	B->CON (RR)	A	0.19667	0.76100	4.83454
	B->CON (FR)	!A	0.14512	1.15377	11.93380
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.17185	0.72137	4.52088
	A->CON (FR)	!B	0.10550	1.07451	11.47050
	B->CON (RR)	A	0.17726	0.73011	4.67330
	B->CON (FR)	!A	0.13247	1.13345	11.79690

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	0.18529	0.92020	6.64199
	A->CON (RF)	!B	0.07734	0.81466	8.89857
	B->CON (FF)	A	0.18523	0.95683	7.00141
	B->CON (RF)	!A	0.09091	0.80653	8.60643
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.16830	0.87697	6.33254
	A->CON (RF)	!B	0.07132	0.80385	8.81468
	B->CON (FF)	A	0.16785	0.91449	6.69075
	B->CON (RF)	!A	0.08513	0.79641	8.52929

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	0.15108	2.11077	28.37180
	A->S (FR)	B	0.25924	2.19136	25.82780
	B->S (RR)	!A	0.16437	2.04786	27.18310
	B->S (FR)	A	0.26023	2.28271	27.06490
	CON->S (FR)	-	0.04129	0.91064	12.13310
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.14897	1.90255	21.60300
	A->S (FR)	B	0.24640	1.96176	18.97960
	B->S (RR)	!A	0.16269	1.85946	20.85730
	B->S (FR)	A	0.24689	2.03418	19.77580
	CON->S (FR)	-	0.04754	1.00928	11.99070

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	0.19320	2.56739	34.55480
	A->S (RF)	B	0.24910	1.74324	19.54160
	B->S (FF)	!A	0.22031	2.63403	34.94720
	B->S (RF)	A	0.25441	1.74898	19.68420
	CON->S (RF)	-	0.03063	0.75010	9.97832
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.18460	2.21519	24.97880
	A->S (RF)	B	0.23274	1.55317	14.16960
	B->S (FF)	!A	0.21195	2.27604	25.33160
	B->S (RF)	A	0.23815	1.56172	14.31170
	CON->S (RF)	-	0.03514	0.80673	9.68481

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	0.00500	0.00474	0.00454
	B	0.00000	0.00000	0.00000
	B	0.00454	0.00431	0.00387
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00412	0.00379	0.00426
	B	0.00000	0.00000	0.00000
	B	0.00366	0.00336	0.00353

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	0.00790	0.00761	0.00823
	B	0.00000	0.00000	0.00000
	B	0.00815	0.00819	0.00888
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00700	0.00668	0.00748
	B	0.00000	0.00000	0.00000
	B	0.00726	0.00722	0.00782

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	0.00500	0.00474	0.00523
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00681	0.00683	0.00696
	B	A	0.00000	0.00000	0.00000
	B	A	0.00454	0.00432	0.00459
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00756	0.00755	0.00753
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00410	0.00378	0.00426
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00622	0.00620	0.00630
	B	A	0.00000	0.00000	0.00000
	B	A	0.00365	0.00335	0.00355
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00697	0.00692	0.00690

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	0.00790	0.00762	0.00835
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00115	0.00112	0.00110
	B	A	0.00000	0.00000	0.00000
	B	A	0.00815	0.00817	0.00888
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00199	0.00188	0.00187
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00700	0.00669	0.00747
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00040	0.00034	0.00028
	B	A	0.00000	0.00000	0.00000
	B	A	0.00726	0.00723	0.00806
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00123	0.00110	0.00103

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	0.00790	0.00762	0.00834
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00116	0.00118	0.00123
	B	A	0.00000	0.00000	0.00000
	B	A	0.00816	0.00819	0.00904
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00201	0.00194	0.00195
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00700	0.00670	0.00752
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00040	0.00035	0.00037
	B	A	0.00000	0.00000	0.00000
	B	A	0.00726	0.00724	0.00805
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00124	0.00113	0.00112

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	0.00501	0.00473	0.00475
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00682	0.00688	0.00695
	B	A	0.00000	0.00000	0.00000
	B	A	0.00454	0.00431	0.00409
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00757	0.00760	0.00754
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00412	0.00379	0.00413
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00622	0.00622	0.00631
	B	A	0.00000	0.00000	0.00000
	B	A	0.00366	0.00336	0.00356
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00698	0.00694	0.00688

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	x	0
1	0	0
1	1	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00528	0.00538	1.94557
sky130_osu_sc_18T_ms__and2_2	0.00529	0.00538	3.80485
sky130_osu_sc_18T_ms__and2_4	0.00528	0.00538	7.29701
sky130_osu_sc_18T_ms__and2_6	0.00532	0.00538	10.71533
sky130_osu_sc_18T_ms__and2_8	0.00530	0.00539	13.62789
sky130_osu_sc_18T_ms__and2_l	0.00412	0.00422	1.34964

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.09434	0.15087
sky130_osu_sc_18T_ms__and2_2	0.00000	0.15087	0.15123
sky130_osu_sc_18T_ms__and2_4	0.00000	0.26393	0.30136
sky130_osu_sc_18T_ms__and2_6	0.00000	0.37699	0.45186
sky130_osu_sc_18T_ms__and2_8	0.00000	0.49004	0.60236
sky130_osu_sc_18T_ms__and2_l	0.00000	0.07233	0.11569

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)	0.10885	0.80499	7.80600
	B->Y (RR)	0.11600	0.82150	7.96555
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.12750	0.75971	8.08179
	B->Y (RR)	0.13445	0.76768	8.21457
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.17731	0.79495	8.57430
	B->Y (RR)	0.18426	0.78890	8.69134
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.22534	0.84329	8.93201
	B->Y (RR)	0.23216	0.83393	9.02602
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.27263	0.89726	9.13599
	B->Y (RR)	0.27942	0.88524	9.21835
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.12211	0.89501	7.90219
	B->Y (RR)	0.12944	0.91154	8.05617

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)	0.09283	0.75228	7.01733
	B->Y (FF)	0.09816	0.76821	7.10144
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.10782	0.72320	7.24675
	B->Y (FF)	0.11385	0.73766	7.32940
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.15094	0.75648	7.70332
	B->Y (FF)	0.15692	0.76821	7.76608
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.19640	0.80498	8.01894
	B->Y (FF)	0.20247	0.81437	8.08694
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.23904	0.84444	8.08775
	B->Y (FF)	0.24539	0.85491	8.15610
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.10185	0.81484	6.94741
	B->Y (FF)	0.10848	0.83459	7.04081

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	0.00393	0.00344	0.00583
	B	0.00000	0.00000	0.00000
	B	0.00400	0.00343	0.00456
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00768	0.00744	0.00949
	B	0.00000	0.00000	0.00000
	B	0.00774	0.00751	0.00839
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01580	0.01614	0.01768
	B	0.00000	0.00000	0.00000
	B	0.01587	0.01625	0.01710
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02386	0.02467	0.02717
	B	0.00000	0.00000	0.00000
	B	0.02403	0.02484	0.02663
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03207	0.03335	0.03660
	B	0.00000	0.00000	0.00000
	B	0.03217	0.03323	0.03611
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00291	0.00252	0.00413
	B	0.00000	0.00000	0.00000
	B	0.00298	0.00252	0.00332

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	0.00949	0.00942	0.01273
	B	0.00000	0.00000	0.00000
	B	0.01068	0.01065	0.01358
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01195	0.01247	0.01556
	B	0.00000	0.00000	0.00000
	B	0.01316	0.01355	0.01639
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01798	0.01953	0.02280
	B	0.00000	0.00000	0.00000
	B	0.01919	0.02052	0.02349
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02412	0.02668	0.03029
	B	0.00000	0.00000	0.00000
	B	0.02528	0.02750	0.03076
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02997	0.03341	0.03754
	B	0.00000	0.00000	0.00000
	B	0.03129	0.03422	0.03774
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00739	0.00737	0.00939
	B	0.00000	0.00000	0.00000
	B	0.00828	0.00819	0.01005

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)	-0.00349	-0.00352	-0.00352
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00348	-0.00352	-0.00352
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00348	-0.00352	-0.00352
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00353	-0.00354
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00348	-0.00351	-0.00352
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00259	-0.00262	-0.00262

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)	0.00352	0.00355	0.00354
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00352	0.00356	0.00354
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00352	0.00356	0.00354
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00354	0.00357	0.00356
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00352	0.00356	0.00354
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00262	0.00265	0.00263

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)	-0.00330	-0.00332	-0.00331
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00330	-0.00332	-0.00331
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00330	-0.00331	-0.00331
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00330	-0.00332	-0.00331
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00330	-0.00332	-0.00330
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00246	-0.00248	-0.00247

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)	0.00332	0.00333	0.00332
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00333	0.00333	0.00332
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00333	0.00333	0.00332
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00333	0.00333	0.00332
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00333	0.00333	0.00333
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00247	0.00248	0.00247

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	x	0	1
x	x	1	0
1	0	0	1
1	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00500	0.00521	0.00504	0.88554

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.03550	0.07525

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)	0.11345	1.13910	11.87630
	A1->Y (FR)	0.09781	1.08931	11.53760
	B0->Y (FR)	0.08267	1.07909	11.62270

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)	0.07009	0.75877	8.11525
	A1->Y (RF)	0.06355	0.76384	8.34647
	B0->Y (RF)	0.04089	0.71104	8.06903

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	0.00824	0.00816	0.00820
	A1	0.00000	0.00000	0.00000
	A1	0.00697	0.00687	0.00690
	B0	0.00652	0.00641	0.00667

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	0.00189	0.00162	0.00156
	A1	0.00000	0.00000	0.00000
	A1	0.00191	0.00162	0.00163
	B0	-0.00078	-0.00086	-0.00084

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)	-0.00278	-0.00307	-0.00307
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00311	-0.00313	-0.00312
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00312	-0.00313	-0.00312

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)	0.00304	0.00308	0.00307
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00311	0.00315	0.00313
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00313	0.00314	0.00313

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)	-0.00277	-0.00301	-0.00303
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00308	-0.00309	-0.00308
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00332	-0.00334	-0.00336

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)	0.00301	0.00301	0.00303
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00308	0.00313	0.00309
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00336	0.00339	0.00337

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)	-0.00160	-0.00161	-0.00160

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)	0.00179	0.00180	0.00165

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	x	0	x	1
0	x	1	0	1
x	x	1	1	0
1	0	0	x	1
1	0	1	0	1
1	1	x	x	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00500	0.00522	0.00538	0.00514	0.85584

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.03923	0.15050

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)	0.14400	1.17546	11.83170
	A1->Y (FR)	0.12878	1.14210	11.65510
	B0->Y (FR)	0.08712	1.06973	11.39600
	B1->Y (FR)	0.10249	1.10547	11.61100

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)	0.09070	0.77457	8.00073
	A1->Y (RF)	0.08419	0.77851	8.24804
	B0->Y (RF)	0.04843	0.73688	8.21086
	B1->Y (RF)	0.05509	0.73215	7.96275

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	0.01010	0.01002	0.01004
	A1	0.00887	0.00873	0.00874
	B0	0.00699	0.00683	0.00715
	B1	0.00820	0.00806	0.00840

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00380	0.00353	0.00342
	A1	0.00383	0.00352	0.00346
	B0	-0.00047	-0.00056	-0.00053
	B1	-0.00040	-0.00052	-0.00053

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)	-0.00282	-0.00305	-0.00306
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00311	-0.00313	-0.00312
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00311	-0.00313	-0.00312
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00311	-0.00313	-0.00312

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)	0.00304	0.00305	0.00306
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00311	0.00316	0.00313
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00313	0.00314	0.00313
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00313	0.00314	0.00313

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)	-0.00279	-0.00303	-0.00303
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00308	-0.00310	-0.00308
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00332	-0.00333	-0.00336
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00332	-0.00333	-0.00336

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)	0.00301	0.00304	0.00303
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00308	0.00313	0.00309
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00336	0.00339	0.00337
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00336	0.00339	0.00337

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)	-0.00160	-0.00162	-0.00161
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00160	-0.00161	-0.00161
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00342	-0.00344	-0.00345
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00341	-0.00344	-0.00345

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)	0.00187	0.00188	0.00168
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00160	0.00161	0.00161
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00345	0.00350	0.00346
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00345	0.00350	0.00346

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)	-0.00161	-0.00163	-0.00162
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00161	-0.00161	-0.00161
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00316	-0.00318	-0.00317
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00316	-0.00318	-0.00317

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)	0.00188	0.00189	0.00169
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00161	0.00163	0.00161
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00319	0.00318	0.00318
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00319	0.00318	0.00318

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00539	1.93803
sky130_osu_sc_18T_ms__buf_2	0.00539	3.79055
sky130_osu_sc_18T_ms__buf_4	0.00539	7.24927
sky130_osu_sc_18T_ms__buf_6	0.00097	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00539	14.05108
sky130_osu_sc_18T_ms__buf_l	0.00427	1.33891

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.07562	0.07562
sky130_osu_sc_18T_ms__buf_2	0.00000	0.11342	0.15087
sky130_osu_sc_18T_ms__buf_4	0.00000	0.18904	0.30136
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.34027	0.60236
sky130_osu_sc_18T_ms__buf_l	0.00000	0.05792	0.05792

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)	0.08019	0.76399	7.72605
sky130_osu_sc_18T_ms__buf_2	A->Y (RR)	0.09015	0.70151	7.93347
sky130_osu_sc_18T_ms__buf_4	A->Y (RR)	0.12238	0.71162	8.30341
sky130_osu_sc_18T_ms__buf_8	A->Y (RR)	0.18414	0.78284	8.99242
sky130_osu_sc_18T_ms__buf_l	A->Y (RR)	0.09047	0.84682	7.73793

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)	0.08853	0.74065	6.94379
sky130_osu_sc_18T_ms__buf_2	A->Y (FF)	0.10436	0.71612	7.20963
sky130_osu_sc_18T_ms__buf_4	A->Y (FF)	0.14755	0.75008	7.64318
sky130_osu_sc_18T_ms__buf_8	A->Y (FF)	0.23592	0.84382	8.22346
sky130_osu_sc_18T_ms__buf_l	A->Y (FF)	0.09861	0.80220	6.85717

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	0.00366	0.00308	0.00515
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00744	0.00709	0.00904
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01557	0.01582	0.01719
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03163	0.03294	0.03517
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00280	0.00232	0.00383

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	0.00920	0.00915	0.01231
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01165	0.01202	0.01501
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01771	0.01903	0.02212
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02976	0.03275	0.03652
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00723	0.00713	0.00915

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
	-0.00049	-0.00049	-0.00049

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
	0.00049	0.00049	0.00049

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT	
D	RN	CK	Q	QN
0	1	R	0	1
1	1	R	1	0
x	0	x	0	1
x	1	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00514	0.00512	0.01499	1.87352	1.88152
sky130_osu_sc_18T_ms__dffr_l	0.00514	0.00512	0.01499	1.34443	1.34339

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.23988	0.36189
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.22218	0.34419

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)	0.43639	1.82265	17.71800
	QN->Q (FR)	0.04298	0.97181	12.86520
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.42929	1.95000	17.51100
	QN->Q (FR)	0.04693	1.03441	12.71180

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)	0.42275	1.89211	19.07760
	QN->Q (RF)	0.03740	0.86274	11.39800
	RN->Q (FF)	0.30533	1.85872	19.80110
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.42969	2.05709	18.98900
	QN->Q (RF)	0.03874	0.87824	10.80940
	RN->Q (FF)	0.31315	2.02565	19.70180

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)	0.36871	1.08715	8.12437
	RN->QN (FR)	0.25116	1.05358	8.84352
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.36949	1.15620	8.18421
	RN->QN (FR)	0.25245	1.12271	8.89262

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)**	0.37158	1.00530	6.64504
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.35783	1.01793	6.38685

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)	-0.08845	-0.12338	-0.61367
	setup	CK (R)	0.34446	0.36566	1.55278
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09013	-0.12502	-0.61180
	setup	CK (R)	0.34310	0.36679	1.56060

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)	-0.16642	-0.51253	-4.11890
	setup	CK (R)	0.20877	0.53109	4.16993
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.16506	-0.51233	-4.11859
	setup	CK (R)	0.20866	0.53103	4.16990

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)	-0.08845	-0.12338	-0.61367
	setup	CK (R)	0.34446	0.36566	1.55278
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09013	-0.12502	-0.61180
	setup	CK (R)	0.34310	0.36679	1.56060

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)	-0.16642	-0.51253	-4.11890
	setup	CK (R)	0.20877	0.53109	4.16993
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.16506	-0.51233	-4.11859
	setup	CK (R)	0.20866	0.53103	4.16990

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)	0.28188	0.30551	1.38326
	removal	CK (R)	-0.04635	-0.05517	-0.13639
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.28234	0.30636	1.40133
	removal	CK (R)	-0.04635	-0.05517	-0.13639

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)	0.28188	0.30551	1.38326
	removal	CK (R)	-0.04635	-0.05517	-0.13639
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.28234	0.30636	1.40133
	removal	CK (R)	-0.04635	-0.05517	-0.13639

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 ()	0.18177	0.56152	13.33370
	min_pulse_width	RN ()	0.18177	0.56152	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.17967	0.56152	13.33370
	min_pulse_width	RN ()	0.17757	0.56152	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 ()	0.19646	0.56152	13.33370
	min_pulse_width	CK ()	0.23422	0.56152	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.18387	0.56152	13.33370
	min_pulse_width	CK ()	0.22793	0.56152	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 ()	0.43144	0.56152	13.33370
	min_pulse_width	CK ()	0.17128	0.56152	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.43144	0.56152	13.33370
	min_pulse_width	CK ()	0.17128	0.56152	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	0.00945	0.00721	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00844	0.00673	-0.00275

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	0.01050	0.00918	0.00000
	RN	-0.00127	-0.06818	-0.97123
	RN	0.02403	0.02281	0.01122
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00947	0.00849	0.00275
	RN	-0.00127	-0.05587	-0.69695
	RN	0.02300	0.02211	0.01670

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	0.01049	0.00919	0.00000
	RN	-0.00127	-0.06836	-0.97533
	RN	0.02402	0.02279	0.01117
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00947	0.00850	0.00269
	RN	-0.00127	-0.05585	-0.69640
	RN	0.02299	0.02210	0.01664

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	0.00941	0.00719	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00840	0.00670	-0.00269

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	-0.00262	-0.00301	-0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01122	0.01062	0.01099
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00508	0.00453	0.00508
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00262	-0.00301	-0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01122	0.01062	0.01099
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00508	0.00453	0.00508

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	0.00303	0.00307	0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01858	0.01831	0.01881
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00868	0.00845	0.00906
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00303	0.00307	0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01858	0.01831	0.01881
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00868	0.00845	0.00906

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)	0.00370	0.00310	0.00498
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01006	0.00924	0.01092
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)	0.00370	0.00310	0.00498
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01006	0.00924	0.01092

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)	0.00846	0.00812	0.01129
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01801	0.01732	0.02016
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)	0.00846	0.00812	0.01129
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01801	0.01732	0.02015

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)	-0.00048	-0.00123	0.00052
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00536	0.00415	0.00554
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00090	-0.00166	0.00011
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00048	-0.00123	0.00052
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00536	0.00415	0.00554
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00091	-0.00166	0.00010

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)	0.01338	0.01306	0.01616
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02861	0.02752	0.02976
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02181	0.02120	0.02376
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02832	0.02744	0.03357
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01493	0.01466	0.01763
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01338	0.01306	0.01616
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02861	0.02752	0.02976
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02181	0.02120	0.02376
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02832	0.02746	0.03357
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01493	0.01465	0.01762

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT				OUTPUT	
D	RN	SN	CK	Q	QN
0	1	1	R	0	1
1	1	1	R	1	0
x	0	x	x	0	1
x	1	0	x	1	0
x	1	1	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00510	0.00513	0.01102	0.01531	1.92818	1.95010
sky130_osu_sc_18T_ms__dffsr_l	0.00510	0.00513	0.01101	0.01531	1.33858	1.34790

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.26060	0.36224
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.24290	0.34453

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)	0.44145	1.80677	17.53650
	QN->Q (FR)	0.04099	0.94731	12.63980
	RN->Q (RR)	0.35182	1.73164	17.58840
	SN->Q (FR)	0.32601	1.80807	18.97070
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.44662	1.97366	17.53000
	QN->Q (FR)	0.04686	1.02827	12.64760
	RN->Q (RR)	0.35749	1.89992	17.57510
	SN->Q (FR)	0.33141	1.97387	18.92960

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)	0.48026	1.92721	18.95790
	QN->Q (RF)	0.03427	0.81882	10.85760
	RN->Q (FF)	0.31526	1.84871	19.69550
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.49287	2.12241	18.97690
	QN->Q (RF)	0.03866	0.87701	10.77280
	RN->Q (FF)	0.32838	2.04238	19.69930

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)	0.42706	1.14779	8.22427
	RN->QN (FR)	0.26316	1.06817	8.95973
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.43120	1.22494	8.27721
	RN->QN (FR)	0.26759	1.14549	9.00299

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)	0.38135	1.01242	6.64609
	RN->QN (RF)	0.29201	0.93813	6.69217
	SN->QN (FF)	0.26641	1.01396	8.07763
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.37704	1.04783	6.50706
	RN->QN (RF)	0.28817	0.97432	6.54968
	SN->QN (FF)	0.26224	1.04813	7.90434

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)	-0.09774	-0.13593	-0.69248
	setup	CK (R)	0.33749	0.35055	1.55189
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09763	-0.13561	-0.69349
	setup	CK (R)	0.33459	0.35012	1.55626

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)	-0.18968	-0.53529	-4.31298
	setup	CK (R)	0.24737	0.55328	4.34612
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.18907	-0.53435	-4.31069
	setup	CK (R)	0.24320	0.55328	4.34364

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)	-0.09774	-0.13593	-0.69248
	setup	CK (R)	0.33749	0.35055	1.55189
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09763	-0.13561	-0.69349
	setup	CK (R)	0.33459	0.35012	1.55626

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)	-0.18968	-0.53529	-4.31298
	setup	CK (R)	0.24737	0.55328	4.34612
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.18907	-0.53435	-4.31069
	setup	CK (R)	0.24320	0.55328	4.34364

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)	0.25063	0.26409	1.30239
	removal	CK (R)	-0.02675	-0.03245	-0.10083
	hold	SN (R)	-0.25599	-0.53529	-3.24607
	setup	SN (R)	0.28525	0.59343	5.35235
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24824	0.26276	1.30123
	removal	CK (R)	-0.02675	-0.03245	-0.10083
	hold	SN (R)	-0.25110	-0.52752	-3.17449
	setup	SN (R)	0.28658	0.58413	5.25631

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)	0.25063	0.26409	1.30239
	removal	CK (R)	-0.02675	-0.03245	-0.10083
	hold	SN (R)	-0.25599	-0.53529	-3.24607
	hold	SN (R)	-0.25727	-0.53792	-3.25694
	setup	SN (R)	0.28525	0.59044	5.18537
	setup	SN (R)	0.28128	0.59343	5.35235
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24824	0.26276	1.30123
	removal	CK (R)	-0.02675	-0.03245	-0.10083
	hold	SN (R)	-0.25595	-0.52752	-3.17449
	hold	SN (R)	-0.25110	-0.52872	-3.18823
	setup	SN (R)	0.28658	0.58331	5.08430
	setup	SN (R)	0.27085	0.58413	5.25631

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 ()	0.20485	0.56152	13.33370
	min_pulse_width	RN ()	0.20695	0.56152	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.20485	0.56152	13.33370
	min_pulse_width	RN ()	0.20065	0.56152	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)	0.05840	0.10213	2.55816
	removal	CK (R)	-0.02009	-0.07255	-0.57141
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.05686	0.10281	2.42915
	removal	CK (R)	-0.02009	-0.07255	-0.57141

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)	0.05840	0.10213	2.55816
	removal	CK (R)	-0.02009	-0.07255	-0.57141
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.05686	0.10281	2.42915
	removal	CK (R)	-0.02009	-0.07255	-0.57141

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 ()	0.25627	0.58970	13.33370
	min_pulse_width	SN ()	0.25494	0.59186	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.25616	0.57886	13.33370
	min_pulse_width	SN ()	0.24402	0.58103	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 ()	0.20065	0.56152	13.33370
	min_pulse_width	CK ()	0.24891	0.56152	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.19436	0.56152	13.33370
	min_pulse_width	CK ()	0.24471	0.56152	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 ()	0.42305	0.56152	13.33370
	min_pulse_width	CK ()	0.21324	0.56152	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.42305	0.56152	13.33370
	min_pulse_width	CK ()	0.21324	0.56152	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	0.01163	0.01003	-0.00133
	RN	0.02123	0.01989	0.00490
	SN	-0.00127	-0.06937	-0.99957
	SN	0.02340	0.02210	0.00674
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01072	0.00905	-0.00217
	RN	0.02030	0.01892	0.00657
	SN	-0.00127	-0.05573	-0.69392
	SN	0.02248	0.02114	0.00856

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	0.01219	0.01112	0.00133
	RN	-0.00127	-0.06937	-0.99957
	RN	0.02467	0.02353	0.01396
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01127	0.01039	0.00488
	RN	-0.00127	-0.05573	-0.69392
	RN	0.02373	0.02276	0.01770

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	0.01218	0.01113	0.00106
	RN	-0.00127	-0.06984	-1.01092
	RN	0.02466	0.02350	0.01390
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01126	0.01038	0.00472
	RN	-0.00127	-0.05596	-0.69874
	RN	0.02372	0.02275	0.01753

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	0.01158	0.00997	-0.00106
	RN	0.02118	0.01984	0.00442
	SN	-0.00127	-0.06984	-1.01090
	SN	0.02336	0.02205	0.00650
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01067	0.00900	-0.00186
	RN	0.02025	0.01886	0.00664
	SN	-0.00127	-0.05596	-0.69872
	SN	0.02243	0.02109	0.00853

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	-0.00297	-0.00304	-0.00304
	(!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)	0.01421	0.01365	0.01405
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00564	0.00511	0.00560
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00562	0.00509	0.00560
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00567	0.00515	0.00563
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00297	-0.00304	-0.00304
	(!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)	0.01421	0.01365	0.01405
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00564	0.00511	0.00560
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00562	0.00509	0.00560
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00567	0.00515	0.00563

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	0.00304	0.00305	0.00304
	(!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)	0.02116	0.02085	0.02113
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00912	0.00893	0.00957
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00920	0.00900	0.00958
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00908	0.00889	0.00952
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00304	0.00305	0.00304
	(!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)	0.02115	0.02084	0.02112
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00911	0.00892	0.00956
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00920	0.00899	0.00959
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00908	0.00888	0.00952

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)	0.00327	0.00264	0.00437
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01203	0.01114	0.01266
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)	0.00327	0.00265	0.00437
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01203	0.01114	0.01266

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)	0.00903	0.00877	0.01204
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01894	0.01821	0.02107
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)	0.00902	0.00876	0.01203
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01893	0.01820	0.02104

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)	-0.00690	-0.00695	-0.00699
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00673	-0.00717	-0.00717
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00666	-0.00690	-0.00689
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00482	0.00422	0.00491
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)	-0.00690	-0.00695	-0.00699
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00672	-0.00716	-0.00716
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00666	-0.00690	-0.00689
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00482	0.00422	0.00492

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)	0.00699	0.00706	0.00702
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00713	0.00722	0.00718
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00687	0.00693	0.00691
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01449	0.01417	0.01459
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)	0.00699	0.00706	0.00702
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00712	0.00721	0.00717
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00686	0.00693	0.00691
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01448	0.01418	0.01459

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)	-0.00048	-0.00124	0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00603	0.00484	0.00633
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00592	0.00475	0.00625
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00074	-0.00149	0.00027
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00434	0.00283	0.00665
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00048	-0.00124	0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00602	0.00483	0.00632
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00592	0.00474	0.00624
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00074	-0.00149	0.00027
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00434	0.00283	0.00665

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)	0.03178	0.03071	0.03296
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01341	0.01307	0.01619
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02217	0.02155	0.02416
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02222	0.02159	0.02418
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03087	0.02996	0.03587
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01479	0.01451	0.01749
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01767	0.01703	0.02328
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03178	0.03071	0.03296
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01341	0.01307	0.01619
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02217	0.02155	0.02416
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02222	0.02159	0.02418
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03087	0.02995	0.03586
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01479	0.01451	0.01749
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01767	0.01702	0.02327

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT	
D	SN	CK	Q	QN
0	1	R	0	1
1	1	R	1	0
x	0	x	1	0
x	1	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00513	0.00886	0.01510	1.90657	1.89045
sky130_osu_sc_18T_ms__dffs_l	0.00513	0.00886	0.01510	1.36052	1.35306

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.24762	0.38302
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.22991	0.36532

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)	0.31651	1.69512	17.80960
	QN->Q (FR)	0.04278	0.97077	12.90670
	SN->Q (FR)	0.23964	1.75616	19.01730
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.31795	1.83239	17.54050
	QN->Q (FR)	0.04675	1.03141	12.73450
	SN->Q (FR)	0.24045	1.88791	18.69870

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)	0.47401	1.95815	19.36920
	QN->Q (RF)	0.03709	0.86340	11.46140
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.47808	2.11609	19.19370
	QN->Q (RF)	0.03843	0.87836	10.83560

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)	0.41704	1.14339	8.17273
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.41524	1.20922	8.25547

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)	0.25889	0.87250	6.52505
	SN->QN (FF)	0.18186	0.93389	7.72060
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.25335	0.89772	6.29097
	SN->QN (FF)	0.17536	0.95310	7.44877

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)	-0.07088	-0.10568	-0.55224
	setup	CK (R)	0.22476	0.25538	1.49323
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.07178	-0.10394	-0.55442
	setup	CK (R)	0.22464	0.25522	1.50316

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)	-0.17108	-0.51762	-4.16855
	setup	CK (R)	0.23835	0.53691	4.20898
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.17394	-0.51828	-4.16731
	setup	CK (R)	0.23409	0.53691	4.20898

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)	-0.07088	-0.10568	-0.55224
	setup	CK (R)	0.22476	0.25538	1.49323
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.07178	-0.10394	-0.55442
	setup	CK (R)	0.22464	0.25522	1.50316

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)	-0.17108	-0.51762	-4.16855
	setup	CK (R)	0.23835	0.53691	4.20898
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.17394	-0.51828	-4.16731
	setup	CK (R)	0.23409	0.53691	4.20898

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)	0.06747	0.10652	1.95775
	removal	CK (R)	-0.02232	-0.06613	-0.52580
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.06609	0.10648	1.84683
	removal	CK (R)	-0.01973	-0.06669	-0.52551

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)	0.06747	0.10652	1.95775
	removal	CK (R)	-0.02232	-0.06613	-0.52580
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.06609	0.10648	1.84683
	removal	CK (R)	-0.01973	-0.06669	-0.52551

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 ()	0.16079	0.56152	13.33370
	min_pulse_width	SN ()	0.16289	0.56152	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.15659	0.56152	13.33370
	min_pulse_width	SN ()	0.15659	0.56152	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 ()	0.13561	0.56152	13.33370
	min_pulse_width	CK ()	0.24471	0.56152	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.13142	0.56152	13.33370
	min_pulse_width	CK ()	0.23842	0.56152	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 ()	0.31185	0.56152	13.33370
	min_pulse_width	CK ()	0.20695	0.56152	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.31185	0.56152	13.33370
	min_pulse_width	CK ()	0.20695	0.56152	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	0.00948	0.00718	0.00000
	SN	-0.00127	-0.06890	-0.98836
	SN	0.02013	0.01794	-0.00362
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00846	0.00670	-0.00309
	SN	-0.00127	-0.05627	-0.70529
	SN	0.01910	0.01749	0.00634

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	0.01042	0.00919	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00941	0.00849	0.00309

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	0.01042	0.00919	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00941	0.00849	0.00303

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	0.00943	0.00714	0.00000
	SN	-0.00127	-0.06855	-0.97996
	SN	0.02008	0.01790	-0.00334
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00841	0.00665	-0.00303
	SN	-0.00127	-0.05609	-0.70140
	SN	0.01906	0.01744	0.00634

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	-0.00301	-0.00308	-0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01084	0.01020	0.01050
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00494	0.00439	0.00491
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00301	-0.00308	-0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01084	0.01020	0.01050
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00494	0.00439	0.00491

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	0.00308	0.00309	0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01798	0.01766	0.01815
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00876	0.00856	0.00922
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00308	0.00309	0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01798	0.01766	0.01815
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00876	0.00856	0.00922

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)	-0.00521	-0.00522	-0.00524
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00377	0.00326	0.00429
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)	-0.00521	-0.00522	-0.00524
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00377	0.00326	0.00429

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)	0.00523	0.00531	0.00525
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01026	0.00986	0.01145
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)	0.00523	0.00531	0.00525
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01026	0.00986	0.01145

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)	-0.00050	-0.00125	0.00050
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00083	-0.00162	0.00018
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00361	0.00213	0.00609
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00050	-0.00125	0.00050
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00083	-0.00162	0.00018
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00361	0.00213	0.00609

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)	0.02828	0.02718	0.02948
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01338	0.01306	0.01616
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02766	0.02670	0.03283
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01484	0.01457	0.01754
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01724	0.01663	0.02297
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02828	0.02718	0.02948
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01338	0.01307	0.01616
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02766	0.02669	0.03283
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01484	0.01457	0.01754
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01724	0.01663	0.02297

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT	
D	CK	Q	QN
0	R	0	1
1	R	1	0
x	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00528	0.01492	1.94573	1.95685
sky130_osu_sc_18T_ms__dff_l	0.00528	0.01491	1.33904	1.33150

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.23855	0.30245
sky130_osu_sc_18T_ms__dff_l	0.00000	0.22085	0.28475

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)	0.28105	1.62674	17.40450
	QN->Q (FR)	0.04069	0.94665	12.65630
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.29201	1.80410	17.35540
	QN->Q (FR)	0.04757	1.04065	12.79860

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)	0.39708	1.84042	18.96570
	QN->Q (RF)	0.03410	0.81813	10.87960
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.41265	2.04503	19.00020
	QN->Q (RF)	0.03850	0.87394	10.75310

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)	0.34645	1.05727	8.12208
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.35274	1.14027	8.16748

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)	0.22765	0.83036	6.41375
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.22851	0.87072	6.20188

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)	-0.06859	-0.10405	-0.57503
	setup	CK (R)	0.18972	0.22388	1.51165
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.06566	-0.10554	-0.57520
	setup	CK (R)	0.19079	0.22222	1.51217

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)	-0.15862	-0.51632	-4.18071
	setup	CK (R)	0.19504	0.53508	4.22258
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.16009	-0.51632	-4.18119
	setup	CK (R)	0.19484	0.53472	4.22488

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 ()	0.12512	0.56152	13.33370
	min_pulse_width	CK ()	0.22373	0.56152	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.12093	0.56152	13.33370
	min_pulse_width	CK ()	0.21954	0.56152	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 ()**	0.27618	0.56152	13.33370
	min_pulse_width	**CK ()**	0.15449	0.56152	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.27409	0.56152	13.33370
	min_pulse_width	**CK ()**	0.15449	0.56152	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	0.00995	0.00819	-0.00006
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00903	0.00724	-0.00267

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	0.01064	0.00955	0.00006
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00973	0.00876	0.00267

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	0.01063	0.00956	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00972	0.00877	0.00263

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	0.00990	0.00816	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00898	0.00720	-0.00263

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	-0.00262	-0.00303	-0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01023	0.00963	0.01003
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00262	-0.00303	-0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01023	0.00963	0.01004

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	0.00302	0.00306	0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01855	0.01816	0.01870
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00302	0.00306	0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01855	0.01816	0.01870

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)	-0.00050	-0.00125	0.00050
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00082	-0.00159	0.00020
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00050	-0.00125	0.00050
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00082	-0.00158	0.00020

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)	0.01333	0.01300	0.01611
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02771	0.02665	0.02896
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02808	0.02707	0.03326
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01478	0.01449	0.01748
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01333	0.01301	0.01611
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02771	0.02666	0.02897
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02808	0.02707	0.03327
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01478	0.01449	0.01748

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00517	1.85829
sky130_osu_sc_18T_ms__inv_10	0.04865	17.01129
sky130_osu_sc_18T_ms__inv_2	0.00992	3.71572
sky130_osu_sc_18T_ms__inv_3	0.01479	5.28851
sky130_osu_sc_18T_ms__inv_4	0.01957	7.11137
sky130_osu_sc_18T_ms__inv_6	0.02935	10.58618
sky130_osu_sc_18T_ms__inv_8	0.03901	13.96465
sky130_osu_sc_18T_ms__inv_l	0.00402	1.30552

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.03781	0.07525
sky130_osu_sc_18T_ms__inv_10	0.00000	0.37808	0.75250
sky130_osu_sc_18T_ms__inv_2	0.00000	0.07562	0.15050
sky130_osu_sc_18T_ms__inv_3	0.00000	0.11342	0.22575
sky130_osu_sc_18T_ms__inv_4	0.00000	0.15123	0.30100
sky130_osu_sc_18T_ms__inv_6	0.00000	0.22685	0.45150
sky130_osu_sc_18T_ms__inv_8	0.00000	0.30246	0.60200
sky130_osu_sc_18T_ms__inv_l	0.00000	0.02896	0.05777

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)**	0.03871	0.87891	11.58750
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.05773	0.63308	11.71290
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.03184	0.76989	11.65790
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.03524	0.72397	11.60650
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.03640	0.69334	11.59660
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.04145	0.66080	11.67330
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.04905	0.64208	11.69970
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.04450	0.96705	11.79900

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)**	0.03071	0.73377	9.68489
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.04876	0.52242	9.59376
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.02590	0.65269	9.71835
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.02822	0.61575	9.68959
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.02848	0.58612	9.68405
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.03529	0.55538	9.72125
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.04192	0.53760	9.70904
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.03452	0.78644	9.64476

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	0.00479	0.00478	0.00507
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04135	0.04260	0.04688
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00860	0.00876	0.00957
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01316	0.01344	0.01434
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01697	0.01729	0.01863
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02514	0.02589	0.02788
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03328	0.03457	0.03766
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00373	0.00371	0.00399

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	-0.00093	-0.00094	-0.00085
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01696	-0.01597	-0.01293
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00309	-0.00298	-0.00271
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00412	-0.00400	-0.00345
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00641	-0.00616	-0.00532
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00977	-0.00936	-0.00791
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01338	-0.01268	-0.01049
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00067	-0.00070	-0.00064

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	**A1**	**S0**	**Y**
0	**0**	**x**	**0**
0	**1**	**0**	**0**
x	**1**	**1**	**1**
1	**x**	**0**	**1**
1	**0**	**1**	**0**

Footprint

Cell Name	Area
sky130_osu_sc_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	0.20778	0.20763	0.01051	0.20124

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.07573	0.07573

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)	-	0.02491	0.41372	3.94368
	A1->Y (RR)	-	0.02635	0.41469	3.94705
	S0->Y (RR)	(!A0 * A1)	0.06980	0.39826	1.60546
	S0->Y (FR)	(A0 * !A1)	0.05444	0.50468	3.60999

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)	-	0.02193	0.37296	3.42798
	A1->Y (FF)	-	0.02088	0.37077	3.42152
	S0->Y (FF)	(!A0 * A1)	0.08971	0.46683	2.30174
	S0->Y (RF)	(A0 * !A1)	0.03574	0.41474	2.87346

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	-	-0.00507	-0.00507	-0.00508
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00357	-0.00357	-0.00358
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00568	0.00551	0.00901
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00332	-0.00393	-0.00167

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	-	0.00507	0.00507	0.00508
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00357	0.00357	0.00358
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00112	0.00056	0.00296
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01281	0.01259	0.01587

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)	-0.00134	-0.00134	-0.00134

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)	0.00134	0.00134	0.00134

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)	-0.00158	-0.00157	-0.00158

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)	0.00158	0.00157	0.00158

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)	-0.00113	-0.00172	0.00065
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00109	-0.00171	0.00066

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)	0.00965	0.00944	0.01275
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00885	0.00867	0.01216

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	x	1
1	0	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00519	0.00514	1.65893
sky130_osu_sc_18T_ms__nand2_l	0.00403	0.00400	1.14493

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.03781	0.15050
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.02897	0.11554

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)	0.03981	0.85296	10.96670
	B->Y (FR)	0.04649	0.85204	10.85560
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.04540	0.93159	11.02870
	B->Y (FR)	0.05337	0.93575	10.99120

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)	0.04582	0.91260	11.75150
	B->Y (RF)	0.05235	0.90695	11.55730
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.05226	0.99051	11.62560
	B->Y (RF)	0.05854	0.98525	11.42970

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	0.00509	0.00468	0.00531
	B	0.00000	0.00000	0.00000
	B	0.00636	0.00587	0.00434
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00392	0.00391	0.00406
	B	0.00000	0.00000	0.00000
	B	0.00486	0.00480	0.00491

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	-0.00057	-0.00064	-0.00056
	B	0.00000	0.00000	0.00000
	B	-0.00052	-0.00060	-0.00056
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00046	-0.00052	-0.00047
	B	0.00000	0.00000	0.00000
	B	-0.00043	-0.00050	-0.00047

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)	-0.00343	-0.00346	-0.00346
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00252	-0.00255	-0.00256

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)	0.00346	0.00349	0.00347
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00255	0.00258	0.00256

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)	-0.00319	-0.00321	-0.00320
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00235	-0.00237	-0.00236

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)	0.00321	0.00322	0.00321
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00237	0.00238	0.00237

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
x	1	0
1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00518	0.00549	0.92393
sky130_osu_sc_18T_ms__nor2_l	0.00396	0.00429	0.64645

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.02662	0.07525
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.02168	0.05777

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)	0.08587	1.08634	11.75580
	B->Y (FR)	0.06633	1.03479	11.42920
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.09718	1.19605	11.79390
	B->Y (FR)	0.08004	1.15717	11.62770

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)	0.04032	0.62708	7.08747
	B->Y (RF)	0.03247	0.61553	7.06700
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.04363	0.65973	7.04075
	B->Y (RF)	0.03633	0.64975	7.02285

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	0.00674	0.00666	0.00674
	B	0.00000	0.00000	0.00000
	B	0.00523	0.00516	0.00551
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00498	0.00492	0.00495
	B	0.00000	0.00000	0.00000
	B	0.00402	0.00392	0.00415

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	0.00082	0.00057	0.00061
	B	0.00000	0.00000	0.00000
	B	-0.00074	-0.00076	-0.00073
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00053	0.00038	0.00040
	B	0.00000	0.00000	0.00000
	B	-0.00050	-0.00053	-0.00052

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)	-0.00264	-0.00304	-0.00307
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00192	-0.00218	-0.00220

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)	0.00305	0.00307	0.00307
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00219	0.00220	0.00220

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)	-0.00160	-0.00162	-0.00161
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00119	-0.00120	-0.00119

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)	0.00170	0.00172	0.00164
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00126	0.00127	0.00121

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	0	x	1
x	1	0	1
x	1	1	0
1	x	0	1
1	x	1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00522	0.00528	0.00447	0.92301

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.03511	0.13302

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)	0.08897	1.06418	11.50800
	A1->Y (FR)	0.11330	1.12053	11.83490
	B0->Y (FR)	0.05561	0.87177	9.81670

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)	0.06469	0.79259	8.62258
	A1->Y (RF)	0.07659	0.78769	8.44307
	B0->Y (RF)	0.05082	0.80095	8.99698

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	0.00702	0.00690	0.00720
	A1	0.00000	0.00000	0.00000
	A1	0.00856	0.00845	0.00849
	B0	0.00587	0.00576	0.00607

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	0.00034	0.00022	0.00022
	A1	0.00000	0.00000	0.00000
	A1	0.00188	0.00163	0.00161
	B0	0.00246	0.00234	0.00236

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)	-0.00160	-0.00162	-0.00161
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00301	-0.00308	-0.00307
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00313	-0.00314	-0.00314

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)	0.00171	0.00172	0.00165
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00306	0.00308	0.00307
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00313	0.00319	0.00314

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)	-0.00259	-0.00299	-0.00302
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00298	-0.00306	-0.00305
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00310	-0.00311	-0.00310

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)	0.00299	0.00303	0.00302
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00303	0.00306	0.00305
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00310	0.00316	0.00311

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)	-0.00257	-0.00259	-0.00263

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)	0.00264	0.00266	0.00265

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	0	x	x	1
x	1	0	0	1
x	1	x	1	0
x	1	1	x	0
1	x	0	0	1
1	x	x	1	0
1	x	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00506	0.00533	0.00549	0.00537	0.92436

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.03992	0.15050

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)	0.12336	1.12949	11.81740
	A1->Y (FR)	0.10344	1.07488	11.49350
	B0->Y (FR)	0.07411	1.04581	11.47700
	B1->Y (FR)	0.09468	1.09923	11.80060

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)	0.10704	0.85541	8.79927
	A1->Y (RF)	0.08638	0.82284	8.68456
	B0->Y (RF)	0.07225	0.82688	9.03386
	B1->Y (RF)	0.09458	0.87039	9.25221

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	0.01109	0.01097	0.01101
	A1	0.00953	0.00939	0.00967
	B0	0.00714	0.00706	0.00739
	B1	0.00875	0.00865	0.00871

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00296	0.00273	0.00267
	A1	0.00153	0.00137	0.00132
	B0	0.00152	0.00138	0.00135
	B1	0.00298	0.00272	0.00271

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)	-0.00264	-0.00304	-0.00307
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00264	-0.00304	-0.00307
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00299	-0.00307	-0.00305
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00310	-0.00312	-0.00311

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)	0.00304	0.00307	0.00307
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00304	0.00307	0.00307
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00303	0.00307	0.00305
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00311	0.00314	0.00312

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)	-0.00159	-0.00161	-0.00160
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00159	-0.00161	-0.00160
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00298	-0.00304	-0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00310	-0.00311	-0.00310

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)	0.00170	0.00171	0.00163
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00170	0.00171	0.00163
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00302	0.00304	0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00310	0.00316	0.00311

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)	-0.00158	-0.00160	-0.00159
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00158	-0.00160	-0.00159
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00331	-0.00339	-0.00337
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00334	-0.00336	-0.00343

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)	0.00169	0.00170	0.00162
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00169	0.00170	0.00162
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00335	0.00339	0.00337
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00344	0.00349	0.00345

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)	-0.00260	-0.00300	-0.00302
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00260	-0.00300	-0.00302
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00336	-0.00345	-0.00343
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00338	-0.00342	-0.00348

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)	0.00300	0.00304	0.00302
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00300	0.00303	0.00302
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00341	0.00345	0.00343
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00348	0.00352	0.00350

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
x	1	1
1	x	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00552	0.00531	1.91349
sky130_osu_sc_18T_ms__or2_2	0.00552	0.00531	3.78670
sky130_osu_sc_18T_ms__or2_4	0.00552	0.00531	7.19923
sky130_osu_sc_18T_ms__or2_8	0.00551	0.00532	13.61676
sky130_osu_sc_18T_ms__or2_l	0.00436	0.00411	1.33130

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.04571	0.07598
sky130_osu_sc_18T_ms__or2_2	0.00000	0.06479	0.15123
sky130_osu_sc_18T_ms__or2_4	0.00000	0.10297	0.30173
sky130_osu_sc_18T_ms__or2_8	0.00000	0.17932	0.60273
sky130_osu_sc_18T_ms__or2_l	0.00000	0.03623	0.05807

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)	0.09298	0.80312	7.83181
	B->Y (RR)	0.08257	0.76662	7.64981
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.10343	0.73984	8.10802
	B->Y (RR)	0.09266	0.70993	7.95798
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.13617	0.74054	8.46489
	B->Y (RR)	0.12508	0.71722	8.32256
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.19775	0.80094	8.99981
	B->Y (RR)	0.18629	0.78377	8.90290
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.10362	0.89382	7.97046
	B->Y (RR)	0.09333	0.85976	7.80387

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)	0.16659	0.87605	7.52657
	B->Y (FF)	0.14059	0.81118	7.03392
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.20294	0.86571	7.87782
	B->Y (FF)	0.17692	0.81142	7.37748
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.28952	0.93349	8.34755
	B->Y (FF)	0.26335	0.88656	7.85997
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.46232	1.11530	8.91044
	B->Y (FF)	0.43648	1.06171	8.48065
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.18504	0.93830	7.42942
	B->Y (FF)	0.15900	0.88495	7.00387

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	0.00543	0.00479	0.00601
	B	0.00000	0.00000	0.00000
	B	0.00393	0.00338	0.00549
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00921	0.00883	0.00997
	B	0.00000	0.00000	0.00000
	B	0.00767	0.00749	0.00943
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01735	0.01757	0.01867
	B	0.00000	0.00000	0.00000
	B	0.01580	0.01631	0.01780
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03346	0.03467	0.03720
	B	0.00000	0.00000	0.00000
	B	0.03192	0.03356	0.03674
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00403	0.00351	0.00440
	B	0.00000	0.00000	0.00000
	B	0.00303	0.00262	0.00414

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	0.01107	0.01101	0.01159
	B	0.00000	0.00000	0.00000
	B	0.00932	0.00943	0.01256
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01347	0.01403	0.01457
	B	0.00000	0.00000	0.00000
	B	0.01172	0.01234	0.01528
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01948	0.02109	0.02179
	B	0.00000	0.00000	0.00000
	B	0.01780	0.01924	0.02227
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03195	0.03463	0.03638
	B	0.00000	0.00000	0.00000
	B	0.02978	0.03270	0.03646
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00849	0.00837	0.00879
	B	0.00000	0.00000	0.00000
	B	0.00724	0.00728	0.00928

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)	-0.00266	-0.00306	-0.00308
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00266	-0.00306	-0.00308
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00266	-0.00306	-0.00308
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00266	-0.00306	-0.00308
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00193	-0.00219	-0.00221

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)	0.00305	0.00307	0.00308
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00305	0.00307	0.00308
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00305	0.00307	0.00308
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00305	0.00307	0.00308
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00219	0.00221	0.00221

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)	-0.00161	-0.00162	-0.00161
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00161	-0.00162	-0.00161
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00161	-0.00162	-0.00161
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00161	-0.00162	-0.00161
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00121	-0.00122	-0.00121

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)	0.00172	0.00173	0.00165
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00173	0.00173	0.00165
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00173	0.00173	0.00165
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00173	0.00173	0.00165
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00128	0.00129	0.00123

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
-	0	HiZ
0	1	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00549	0.00696	0.92477
sky130_osu_sc_18T_ms__tbufi_l	0.00430	0.00547	0.64510

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.03806	0.15050
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.02907	0.11554

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)	0.06298	1.03114	11.43030
	OE->Y (FR)	0.05958	0.34173	4.28374
	OE->Y (RR)	0.11377	0.94365	7.74200
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.07655	1.15439	11.62490
	OE->Y (FR)	0.06491	0.34526	4.28356
	OE->Y (RR)	0.12713	1.06809	7.90936

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)	0.04436	0.74911	8.51120
	OE->Y (FF)	0.06029	0.34178	4.28374
	OE->Y (RF)	0.04354	0.73762	8.26831
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.05134	0.80838	8.47391
	OE->Y (FF)	0.06593	0.34643	4.28355
	OE->Y (RF)	0.05080	0.79671	8.22823

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	0.00487	0.00482	0.00513
	OE	0.00000	0.00000	0.00000
	OE	0.00485	0.00432	0.00665
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00376	0.00368	0.00388
	OE	0.00000	0.00000	0.00000
	OE	0.00350	0.00306	0.00471

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	-0.00074	-0.00076	-0.00075
	OE	0.00000	0.00000	0.00000
	OE	0.00341	0.00284	0.00538
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00050	-0.00054	-0.00052
	OE	0.00000	0.00000	0.00000
	OE	0.00240	0.00196	0.00369

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)	-0.00254	-0.00257	-0.00255
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00227	-0.00230	-0.00229
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00195	-0.00197	-0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00177	-0.00180	-0.00178

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)	0.00254	0.00257	0.00255
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00236	0.00238	0.00233
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00195	0.00197	0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00183	0.00185	0.00181

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)	0.00196	0.00149	0.00399
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00177	0.00124	0.00375
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00136	0.00098	0.00269
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00121	0.00080	0.00251

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)	0.00567	0.00523	0.00860
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00568	0.00537	0.00870
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00449	0.00415	0.00628
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00453	0.00424	0.00636

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
0	0	1
1	0	0
-	1	HiZ

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00548	0.00855	0.92490
sky130_osu_sc_18T_ms__tnbufi_l	0.00430	0.00647	0.64515

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.06302	0.07562
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.04828	0.05792

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)	0.06373	1.03130	11.43130
	OE->Y (RR)	0.03652	0.34213	4.28500
	OE->Y (FR)	0.08029	1.07820	11.75750
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.07740	1.15445	11.62540
	OE->Y (RR)	0.03874	0.34245	4.28515
	OE->Y (FR)	0.09114	1.19045	11.79080

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)	0.04371	0.74889	8.51158
	OE->Y (RF)	0.03633	0.34215	4.28480
	OE->Y (FF)	0.07867	0.69758	5.52776
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.05052	0.80808	8.47391
	OE->Y (RF)	0.03844	0.34244	4.28515
	OE->Y (FF)	0.08994	0.77015	5.52424

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	0.00499	0.00494	0.00525
	OE	0.00000	0.00000	0.00000
	OE	0.01204	0.01176	0.01588
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00388	0.00380	0.00400
	OE	0.00000	0.00000	0.00000
	OE	0.00906	0.00895	0.01146

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	-0.00090	-0.00091	-0.00088
	OE	0.00000	0.00000	0.00000
	OE	0.01079	0.01081	0.01438
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00066	-0.00069	-0.00067
	OE	0.00000	0.00000	0.00000
	OE	0.00810	0.00805	0.01033

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)	-0.00219	-0.00222	-0.00220
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00195	-0.00197	-0.00196
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00162	-0.00164	-0.00163
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00146	-0.00148	-0.00147

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)	0.00219	0.00222	0.00220
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00202	0.00204	0.00200
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00162	0.00164	0.00163
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00151	0.00152	0.00149

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)	-0.00352	-0.00442	-0.00166
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00353	-0.00440	-0.00162
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00253	-0.00317	-0.00133
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00252	-0.00315	-0.00131

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)	0.00914	0.00910	0.01289
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00898	0.00895	0.01272
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00692	0.00682	0.00925
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00680	0.00670	0.00911

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01083	0.00985	0.96599

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.12831	0.22612

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (RR)	B	0.14504	1.00928	8.18012
	A->Y (FR)	!B	0.08334	1.06840	11.71680
	B->Y (RR)	A	0.11597	0.97488	8.09426
	B->Y (FR)	!A	0.11078	1.12420	12.04720

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (FF)	B	0.13338	0.82217	6.20103
	A->Y (RF)	!B	0.06561	0.78034	8.62934
	B->Y (FF)	A	0.11847	0.80606	6.19765
	B->Y (RF)	!A	0.07880	0.79797	8.64063

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	0.00476	0.00407	0.00613
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01200	0.01175	0.01546
	B	A	0.00000	0.00000	0.00000
	B	A	0.00183	0.00137	0.00373
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01308	0.01276	0.01644

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	0.01500	0.01444	0.01751
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00340	0.00271	0.00505
	B	A	0.00000	0.00000	0.00000
	B	A	0.01346	0.01348	0.01685
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00456	0.00377	0.00608

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01084	0.00990	0.93509

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.12831	0.20938

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	0.13859	0.98034	7.91314
	A->Y (FR)	B	0.10093	1.10339	11.86920
	B->Y (RR)	!A	0.11915	0.96753	7.91557
	B->Y (FR)	A	0.10921	1.11372	11.86620

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	0.12065	0.79034	5.91434
	A->Y (RF)	B	0.06210	0.78086	8.57499
	B->Y (FF)	!A	0.11213	0.78107	5.89466
	B->Y (RF)	A	0.07300	0.77321	8.33475

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	0.01392	0.01363	0.01731
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00267	0.00154	0.00373
	B	A	0.00000	0.00000	0.00000
	B	A	0.01430	0.01404	0.01772
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00163	0.00111	0.00349

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	0.00318	0.00227	0.00460
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01516	0.01504	0.01831
	B	A	0.00000	0.00000	0.00000
	B	A	0.00319	0.00237	0.00471
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01369	0.01376	0.01717

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_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	0.46491
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	167290.00000	334580.00000
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
	-0.00207	0.03911	0.49261

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
	2.91110	2.73642	0.62252