sky130_osu_sc_15T_ms_tt_1P20_25C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_MS__ADDFx
SKY130_OSU_SC_15T_MS__ADDHx
SKY130_OSU_SC_15T_MS__AND2x
SKY130_OSU_SC_15T_MS__AOI21
SKY130_OSU_SC_15T_MS__AOI22
SKY130_OSU_SC_15T_MS__BUFx
SKY130_OSU_SC_15T_MS__DFFRx
SKY130_OSU_SC_15T_MS__DFFSRx
SKY130_OSU_SC_15T_MS__DFFSx
SKY130_OSU_SC_15T_MS__DFFx
SKY130_OSU_SC_15T_MS__INVx
SKY130_OSU_SC_15T_MS__MUX2
SKY130_OSU_SC_15T_MS__NAND2x
SKY130_OSU_SC_15T_MS__NOR2x
SKY130_OSU_SC_15T_MS__OAI21
SKY130_OSU_SC_15T_MS__OAI22
SKY130_OSU_SC_15T_MS__OR2x
SKY130_OSU_SC_15T_MS__TBUFIx
SKY130_OSU_SC_15T_MS__TNBUFIx
SKY130_OSU_SC_15T_MS__XNOR2
SKY130_OSU_SC_15T_MS__XOR2
SKY130_OSU_SC_15T_MS_x

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01401	0.01407	0.01100	0.74649	0.31405	0.72255
sky130_osu_sc_15T_ms__addf_l	0.01403	0.01407	0.01099	0.45715	0.31526	0.45797

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.06261	0.07902
sky130_osu_sc_15T_ms__addf_l	0.00000	0.04079	0.05721

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.34850	2.75369	27.75900
	B->CO (RR)	0.32294	2.67191	27.09190
	CI->CO (RR)	0.33096	2.73671	27.80970
	CON->CO (FR)	0.05942	1.11862	12.54330
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.36051	2.55467	21.93810
	B->CO (RR)	0.33611	2.48750	21.52790
	CI->CO (RR)	0.34293	2.53864	22.01160
	CON->CO (FR)	0.07955	1.28016	12.75630

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.60063	4.11539	40.42400
	B->CO (FF)	0.55490	3.99413	39.42600
	CI->CO (FF)	0.54018	4.00441	39.93710
	CON->CO (RF)	0.04343	0.84939	9.64151
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.57447	3.39342	27.97280
	B->CO (FF)	0.52997	3.29603	27.36340
	CI->CO (FF)	0.51401	3.28232	27.51200
	CON->CO (RF)	0.04605	0.82837	8.69048

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (FR)	0.39791	1.72624	12.98070
	B->CON (FR)	0.35440	1.64669	12.70080
	CI->CON (FR)	0.33751	1.61594	12.53820
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.37812	1.70844	12.98330
	B->CON (FR)	0.33576	1.62953	12.70820
	CI->CON (FR)	0.31767	1.59809	12.54580

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (RF)	0.19088	1.01132	8.49550
	B->CON (RF)	0.18280	0.98321	8.41842
	CI->CON (RF)	0.17317	0.99676	8.60486
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.18286	1.00435	8.50047
	B->CON (RF)	0.17517	0.97656	8.42288
	CI->CON (RF)	0.16507	0.98971	8.60992

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-R)	0.83840	4.08709	33.72730
	B->S (-R)	0.83955	4.04851	33.37710
	CI->S (-R)	0.77280	3.96445	33.19770
	CON->S (RR)	0.18766	1.19422	9.70578
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.80771	3.64864	26.50380
	B->S (-R)	0.80854	3.62540	26.30750
	CI->S (-R)	0.74177	3.52525	25.99970
	CON->S (RR)	0.19545	1.31439	9.67960

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-F)	0.62776	2.69131	21.10860
	B->S (-F)	0.64071	2.60107	20.55950
	CI->S (-F)	0.60813	2.66685	21.14710
	CON->S (FF)	0.26078	1.15012	8.17734
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.58181	2.33618	16.33580
	B->S (-F)	0.59597	2.26209	15.98980
	CI->S (-F)	0.56214	2.31239	16.39930
	CON->S (FF)	0.24089	1.11069	7.36367

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00174	0.00165	0.00164
	B	0.00204	0.00204	0.00205
	CI	0.00206	0.00210	0.00212
sky130_osu_sc_15T_ms__addf_l	A	0.00139	0.00127	0.00123
	B	0.00170	0.00165	0.00162
	CI	0.00171	0.00172	0.00170

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00553	0.00553	0.00557
	B	0.00544	0.00551	0.00554
	CI	0.00480	0.00493	0.00496
sky130_osu_sc_15T_ms__addf_l	A	0.00520	0.00518	0.00517
	B	0.00511	0.00515	0.00515
	CI	0.00447	0.00459	0.00457

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00552	0.00552	0.00540
	B	0.00543	0.00549	0.00541
	CI	0.00479	0.00492	0.00490
sky130_osu_sc_15T_ms__addf_l	A	0.00519	0.00518	0.00506
	B	0.00511	0.00515	0.00506
	CI	0.00446	0.00458	0.00455

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00171	0.00163	0.00155
	B	0.00202	0.00200	0.00194
	CI	0.00205	0.00208	0.00205
sky130_osu_sc_15T_ms__addf_l	A	0.00136	0.00126	0.00119
	B	0.00167	0.00163	0.00156
	CI	0.00171	0.00171	0.00167

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00553	0.00553	0.00556
	B	0.00544	0.00551	0.00553
	CI	0.00480	0.00493	0.00496
sky130_osu_sc_15T_ms__addf_l	A	0.00520	0.00519	0.00517
	B	0.00511	0.00516	0.00514
	CI	0.00447	0.00459	0.00459

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01117	0.01126	0.01120
	B	0.01024	0.01010	0.01010
	CI	0.00915	0.00918	0.00915
sky130_osu_sc_15T_ms__addf_l	A	0.01068	0.01069	0.01062
	B	0.00974	0.00957	0.00957
	CI	0.00867	0.00866	0.00860

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00696	0.00765	0.73042	0.33478	0.74612
sky130_osu_sc_15T_ms__addh_l	0.00696	0.00765	0.47008	0.32821	0.47091

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.06911	0.07894
sky130_osu_sc_15T_ms__addh_l	0.00000	0.04183	0.05712

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.24315	1.24242	9.71812
	B->CO (RR)	0.24954	1.25048	9.96277
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.25335	1.37516	9.85489
	B->CO (RR)	0.25972	1.38511	10.11270

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (FF)	0.21076	1.05086	8.01834
	B->CO (FF)	0.22007	1.06357	8.08819
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.19768	0.98619	6.84513
	B->CO (FF)	0.20678	0.99971	6.92160

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (RR)	B	0.31981	1.07199	6.09332
	A->CON (FR)	!B	0.23623	1.50700	12.57910
	B->CON (RR)	A	0.32560	1.07927	6.34007
	B->CON (FR)	!A	0.28034	1.60059	13.03460
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.29480	1.03839	5.93469
	A->CON (FR)	!B	0.21678	1.47642	12.41670
	B->CON (RR)	A	0.30089	1.04770	6.19039
	B->CON (FR)	!A	0.26088	1.56973	12.84670

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (FF)	B	0.31348	1.19716	7.52255
	A->CON (RF)	!B	0.11775	0.94629	8.68614
	B->CON (FF)	A	0.31440	1.21772	7.72215
	B->CON (RF)	!A	0.13986	0.95271	8.57852
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.29158	1.16470	7.33216
	A->CON (RF)	!B	0.10991	0.93253	8.60959
	B->CON (FF)	A	0.29224	1.18632	7.53572
	B->CON (RF)	!A	0.13211	0.93983	8.50626

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (RR)	!B	0.25275	2.61382	27.36650
	A->S (FR)	B	0.44989	2.84456	26.04360
	B->S (RR)	!A	0.27519	2.58355	26.76990
	B->S (FR)	A	0.45136	2.90519	26.73380
	CON->S (FR)	-	0.06202	1.13357	12.69150
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.25791	2.42166	21.96270
	A->S (FR)	B	0.44135	2.63999	20.57550
	B->S (RR)	!A	0.28086	2.40646	21.58500
	B->S (FR)	A	0.44237	2.68844	21.05460
	CON->S (FR)	-	0.07851	1.28236	12.87580

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (FF)	!B	0.40102	3.70437	38.31270
	A->S (RF)	B	0.42997	2.36963	20.78060
	B->S (FF)	!A	0.44515	3.80027	38.82020
	B->S (RF)	A	0.43607	2.37553	21.00040
	CON->S (RF)	-	0.04140	0.83610	9.52037
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.37400	3.05804	27.10330
	A->S (RF)	B	0.40113	2.03670	14.93870
	B->S (FF)	!A	0.41758	3.15363	27.57380
	B->S (RF)	A	0.40728	2.04535	15.20620
	CON->S (RF)	-	0.04385	0.82496	8.72320

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00252	0.00241	0.00230
	B	0.00000	0.00000	0.00000
	B	0.00234	0.00225	0.00212
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00218	0.00205	0.00198
	B	0.00000	0.00000	0.00000
	B	0.00200	0.00190	0.00180

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00386	0.00374	0.00359
	B	0.00000	0.00000	0.00000
	B	0.00398	0.00397	0.00383
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00353	0.00340	0.00328
	B	0.00000	0.00000	0.00000
	B	0.00366	0.00363	0.00351

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00251	0.00241	0.00249
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00337	0.00336	0.00335
	B	A	0.00000	0.00000	0.00000
	B	A	0.00233	0.00225	0.00217
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00367	0.00366	0.00362
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00218	0.00205	0.00198
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00314	0.00312	0.00311
	B	A	0.00000	0.00000	0.00000
	B	A	0.00200	0.00190	0.00183
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00344	0.00342	0.00323

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00386	0.00375	0.00370
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00063	0.00062	0.00058
	B	A	0.00000	0.00000	0.00000
	B	A	0.00398	0.00397	0.00395
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00104	0.00099	0.00095
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00353	0.00341	0.00336
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00032	0.00031	0.00027
	B	A	0.00000	0.00000	0.00000
	B	A	0.00365	0.00363	0.00360
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00073	0.00068	0.00064

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00387	0.00375	0.00370
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00063	0.00064	0.00062
	B	A	0.00000	0.00000	0.00000
	B	A	0.00398	0.00398	0.00395
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00105	0.00101	0.00099
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00354	0.00341	0.00338
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00033	0.00032	0.00030
	B	A	0.00000	0.00000	0.00000
	B	A	0.00366	0.00363	0.00362
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00075	0.00069	0.00067

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00252	0.00241	0.00231
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00336	0.00338	0.00339
	B	A	0.00000	0.00000	0.00000
	B	A	0.00234	0.00225	0.00216
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00367	0.00368	0.00368
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00218	0.00205	0.00203
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00314	0.00313	0.00313
	B	A	0.00000	0.00000	0.00000
	B	A	0.00200	0.00190	0.00182
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00344	0.00343	0.00342

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00371	0.00380	0.73515
sky130_osu_sc_15T_ms__and2_2	0.00371	0.00380	1.46032
sky130_osu_sc_15T_ms__and2_4	0.00371	0.00380	2.83626
sky130_osu_sc_15T_ms__and2_6	0.00375	0.00380	4.26559
sky130_osu_sc_15T_ms__and2_8	0.00372	0.00381	5.50873
sky130_osu_sc_15T_ms__and2_l	0.00285	0.00295	0.45846

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.03288	0.05257
sky130_osu_sc_15T_ms__and2_2	0.00000	0.05258	0.05266
sky130_osu_sc_15T_ms__and2_4	0.00000	0.09198	0.10504
sky130_osu_sc_15T_ms__and2_6	0.00000	0.13138	0.15751
sky130_osu_sc_15T_ms__and2_8	0.00000	0.17078	0.20998
sky130_osu_sc_15T_ms__and2_l	0.00000	0.00559	0.00890

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.18289	1.15019	9.28916
	B->Y (RR)	0.19320	1.16614	9.57073
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.21397	1.07760	9.63701
	B->Y (RR)	0.22407	1.08710	9.90272
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.30054	1.10392	10.24450
	B->Y (RR)	0.31066	1.10891	10.42260
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.38698	1.17255	10.77010
	B->Y (RR)	0.39686	1.18078	10.92240
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.47022	1.25211	11.00450
	B->Y (RR)	0.48031	1.26152	11.15950
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.20329	1.29778	9.31436
	B->Y (RR)	0.21365	1.31266	9.58148

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (FF)	0.15770	0.96184	7.41325
	B->Y (FF)	0.16650	0.97842	7.55411
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.18919	0.94144	7.84661
	B->Y (FF)	0.19852	0.95535	7.93793
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.27248	0.99409	8.41398
	B->Y (FF)	0.28121	1.00529	8.48403
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.35769	1.07722	8.90901
	B->Y (FF)	0.36599	1.08659	8.96213
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.43842	1.15799	9.12820
	B->Y (FF)	0.44637	1.16655	9.18069
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.18245	0.99805	6.97294
	B->Y (FF)	0.19589	1.01935	7.10373

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00200	0.00179	0.00184
	B	0.00000	0.00000	0.00000
	B	0.00204	0.00184	0.00179
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00375	0.00367	0.00371
	B	0.00000	0.00000	0.00000
	B	0.00379	0.00372	0.00367
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00761	0.00782	0.00798
	B	0.00000	0.00000	0.00000
	B	0.00766	0.00791	0.00803
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01146	0.01154	0.01241
	B	0.00000	0.00000	0.00000
	B	0.01150	0.01184	0.01241
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01528	0.01588	0.01652
	B	0.00000	0.00000	0.00000
	B	0.01531	0.01604	0.01644
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00146	0.00129	0.00132
	B	0.00000	0.00000	0.00000
	B	0.00150	0.00133	0.00129

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00473	0.00461	0.00468
	B	0.00000	0.00000	0.00000
	B	0.00530	0.00519	0.00524
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00594	0.00606	0.00615
	B	0.00000	0.00000	0.00000
	B	0.00652	0.00664	0.00669
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00893	0.00957	0.00971
	B	0.00000	0.00000	0.00000
	B	0.00952	0.01011	0.01022
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01198	0.01309	0.01339
	B	0.00000	0.00000	0.00000
	B	0.01256	0.01361	0.01385
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01487	0.01648	0.01693
	B	0.00000	0.00000	0.00000
	B	0.01547	0.01694	0.01734
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00362	0.00351	0.00354
	B	0.00000	0.00000	0.00000
	B	0.00404	0.00392	0.00395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00163	-0.00164
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00163	-0.00164
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00163	-0.00164
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00163	-0.00164	-0.00165
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00163	-0.00164
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00116	-0.00115	-0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00166	0.00164
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00166	0.00165
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00165	0.00165
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00165	0.00167	0.00166
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00165	0.00165
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00117	0.00118	0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00110	-0.00110	-0.00110

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00154	0.00156	0.00154
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00154	0.00156	0.00154
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00154	0.00156	0.00154
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00154	0.00156	0.00154
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00154	0.00156	0.00154
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00110	0.00110	0.00110

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00346	0.00365	0.00355	0.31566

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.01331	0.02624

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.21122	1.56134	12.93950
	A1->Y (FR)	0.18237	1.49453	12.66350
	B0->Y (FR)	0.15987	1.45905	12.53490

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (RF)	0.10029	0.90339	8.28219
	A1->Y (RF)	0.09131	0.89217	8.34795
	B0->Y (RF)	0.05365	0.76336	7.63573

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00383	0.00380	0.00338
	A1	0.00000	0.00000	0.00000
	A1	0.00325	0.00320	0.00282
	B0	0.00316	0.00309	0.00308

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00087	0.00076	0.00069
	A1	0.00000	0.00000	0.00000
	A1	0.00088	0.00076	0.00069
	B0	-0.00028	-0.00029	-0.00034

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00129	-0.00138	-0.00137
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00140	-0.00141	-0.00141
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00140	-0.00141	-0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00137	0.00138	0.00137
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00141	0.00143	0.00141
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00141	0.00143	0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00127	-0.00135	-0.00135
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00138	-0.00138	-0.00138
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00150	-0.00151	-0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00135	0.00135	0.00135
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00138	0.00138	0.00139
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00152	0.00154	0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00080	-0.00080	-0.00080

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00091	0.00092	0.00083

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_ms__aoi22_l	0.00346	0.00363	0.00377	0.00356	0.31906

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.01486	0.05247

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.26105	1.61229	12.94950
	A1->Y (FR)	0.23576	1.57470	12.89970
	B0->Y (FR)	0.16563	1.44599	12.44820
	B1->Y (FR)	0.19077	1.48763	12.55870

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (RF)	0.12681	0.93593	8.33967
	A1->Y (RF)	0.11771	0.92467	8.41311
	B0->Y (RF)	0.07452	0.87040	8.35706
	B1->Y (RF)	0.08282	0.88257	8.29052

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00472	0.00468	0.00373
	A1	0.00414	0.00408	0.00376
	B0	0.00339	0.00331	0.00329
	B1	0.00394	0.00387	0.00386

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00173	0.00163	0.00154
	A1	0.00174	0.00163	0.00152
	B0	-0.00014	-0.00015	-0.00020
	B1	-0.00013	-0.00014	-0.00019

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00130	-0.00138	-0.00137
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00140	-0.00141	-0.00141
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00140	-0.00141	-0.00141
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00140	-0.00141	-0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00137	0.00138	0.00137
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00141	0.00144	0.00141
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00141	0.00143	0.00141
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00141	0.00143	0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00128	-0.00136	-0.00135
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00138	-0.00138	-0.00138
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00150	-0.00151	-0.00152
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00150	-0.00151	-0.00152

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00134	0.00137	0.00135
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00138	0.00139	0.00139
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00153	0.00154	0.00153
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00153	0.00154	0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00081	-0.00081	-0.00080
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00080	-0.00080	-0.00080
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00156	-0.00158	-0.00159
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00156	-0.00158	-0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00096	0.00097	0.00085
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00080	0.00081	0.00080
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00158	0.00161	0.00159
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00158	0.00161	0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00081	-0.00081	-0.00081
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00080	-0.00081	-0.00081
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00144	-0.00145	-0.00144
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00144	-0.00145	-0.00144

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00097	0.00097	0.00085
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00080	0.00081	0.00081
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00144	0.00146	0.00144
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00144	0.00146	0.00144

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__buf_1	7.93650
sky130_osu_sc_15T_ms__buf_2	10.37850
sky130_osu_sc_15T_ms__buf_4	15.26250
sky130_osu_sc_15T_ms__buf_6	20.14650
sky130_osu_sc_15T_ms__buf_8	25.03050
sky130_osu_sc_15T_ms__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00381	0.73666
sky130_osu_sc_15T_ms__buf_2	0.00385	1.45638
sky130_osu_sc_15T_ms__buf_4	0.00383	2.89220
sky130_osu_sc_15T_ms__buf_6	0.00090	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00385	5.62840
sky130_osu_sc_15T_ms__buf_l	0.00298	0.45481

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.02633	0.02633
sky130_osu_sc_15T_ms__buf_2	0.00000	0.03950	0.05257
sky130_osu_sc_15T_ms__buf_4	0.00000	0.06583	0.10504
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.11850	0.20998
sky130_osu_sc_15T_ms__buf_l	0.00000	0.00452	0.00452

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (RR)**	0.12482	1.09400	9.26163
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.14097	0.99979	9.50710
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.19248	0.99325	10.16990
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.29423	1.05922	10.82690
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.14503	1.22816	9.12044

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (FF)**	0.15047	0.94842	7.34842
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.18448	0.94577	7.96378
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.26821	1.00254	8.69776
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.43581	1.16642	9.46994
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.17689	0.98453	6.88376

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00190	0.00163	0.00167
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00365	0.00348	0.00351
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00755	0.00765	0.00764
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01524	0.01558	0.01646
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00143	0.00121	0.00122

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00465	0.00450	0.00458
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00588	0.00593	0.00601
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00889	0.00944	0.00957
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01489	0.01636	0.01675
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00359	0.00344	0.00348

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00032	-0.00032	-0.00031

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00032	0.00032	0.00031

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00356	0.00357	0.01095	0.71196	0.70704
sky130_osu_sc_15T_ms__dffr_l	0.00356	0.00357	0.01093	0.45601	0.45911

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.07730	0.13323
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.05549	0.11142

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	0.90105	2.63805	18.03810
	QN->Q (FR)	0.07014	1.23940	13.69280
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.86510	2.70071	16.72230
	QN->Q (FR)	0.08468	1.34794	13.40620

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RF)	0.75738	2.71899	20.91780
	QN->Q (RF)	0.04823	0.89898	10.14110
	RN->Q (FF)	0.52112	2.56181	21.66890
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.78065	2.91809	19.84500
	QN->Q (RF)	0.04890	0.86608	9.13205
	RN->Q (FF)	0.54578	2.76034	20.57680

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->QN (RR)	0.65858	1.66732	10.14310
	RN->QN (FR)	0.42127	1.50856	10.89830
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.66945	1.80070	10.27560
	RN->QN (FR)	0.43304	1.64234	11.01640

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	**CK->QN (RF)**	0.77462	1.56805	7.21064
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.72297	1.50131	6.50998

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.15221	-0.18852	-1.09080
	setup	CK (R)	0.70980	0.70156	1.83518
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.15156	-0.19045	-1.09167
	setup	CK (R)	0.71342	0.70185	1.85464

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.30575	-0.73504	-6.96313
	setup	CK (R)	0.37122	0.77232	7.04497
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.30801	-0.73802	-6.95983
	setup	CK (R)	0.37111	0.77232	7.04483

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.15221	-0.18852	-1.09080
	setup	CK (R)	0.70980	0.70156	1.83518
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.15156	-0.19045	-1.09167
	setup	CK (R)	0.71342	0.70185	1.85464

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.30575	-0.73504	-6.96313
	setup	CK (R)	0.37122	0.77232	7.04497
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.30801	-0.73802	-6.95983
	setup	CK (R)	0.37111	0.77232	7.04483

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.61785	0.61357	1.49061
	removal	CK (R)	-0.11193	-0.12719	-0.19680
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.62202	0.61798	1.49882
	removal	CK (R)	-0.11193	-0.12719	-0.19680

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.61785	0.61357	1.49061
	removal	CK (R)	-0.11193	-0.12719	-0.19680
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.62202	0.61798	1.49882
	removal	CK (R)	-0.11193	-0.12719	-0.19680

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	RN ()	0.31383	0.70085	13.33370
	min_pulse_width	RN ()	0.31383	0.70085	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.31200	0.69654	13.33370
	min_pulse_width	RN ()	0.30938	0.69654	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.41669	0.61048	13.33370
	min_pulse_width	CK ()	0.45166	0.59326	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.38266	0.59972	13.33370
	min_pulse_width	CK ()	0.43839	0.59326	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.86947	0.89665	13.33370
	min_pulse_width	CK ()	0.30821	0.66427	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.87364	0.90096	13.33370
	min_pulse_width	CK ()	0.30821	0.66427	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00480	0.00430	0.00134
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00425	0.00381	0.00207

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00523	0.00485	0.00244
	RN	-0.00066	-0.02360	-0.25631
	RN	0.01175	0.01142	0.00888
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00466	0.00438	0.00327
	RN	-0.00066	-0.01806	-0.16416
	RN	0.01118	0.01094	0.00968

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00523	0.00486	0.00244
	RN	-0.00066	-0.02350	-0.25453
	RN	0.01175	0.01142	0.00889
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00466	0.00438	0.00326
	RN	-0.00066	-0.01814	-0.16528
	RN	0.01118	0.01094	0.00967

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00477	0.00428	0.00127
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00422	0.00377	0.00218

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00122	-0.00136	-0.00137
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00542	0.00520	0.00501
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00232	0.00211	0.00199
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00122	-0.00136	-0.00137
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00542	0.00520	0.00501
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00232	0.00211	0.00199

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00136	0.00136	0.00137
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00862	0.00850	0.00835
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00410	0.00400	0.00394
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00136	0.00136	0.00137
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00862	0.00850	0.00835
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00410	0.00400	0.00394

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00180	0.00153	0.00148
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00510	0.00472	0.00456
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00180	0.00153	0.00148
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00510	0.00472	0.00456

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00433	0.00416	0.00421
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00885	0.00855	0.00842
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00433	0.00416	0.00421
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00884	0.00855	0.00842

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00016	-0.00048	-0.00062
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00262	0.00217	0.00185
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00036	-0.00071	-0.00081
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00016	-0.00048	-0.00062
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00262	0.00217	0.00185
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00036	-0.00071	-0.00082

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00695	0.00673	0.00669
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01403	0.01360	0.01321
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01056	0.01034	0.01015
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01392	0.01349	0.01340
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00744	0.00723	0.00726
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00695	0.00673	0.00669
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01403	0.01360	0.01321
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01056	0.01034	0.01015
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01392	0.01349	0.01340
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00744	0.00723	0.00726

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_15T_ms__dffsr_1	0.00351	0.00358	0.00793	0.01121	0.75572	0.75391
sky130_osu_sc_15T_ms__dffsr_l	0.00351	0.00358	0.00792	0.01121	0.46158	0.45859

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.09668	0.13316
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.07487	0.11135

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.83873	2.58969	18.62760
	QN->Q (FR)	0.06317	1.16934	13.22130
	RN->Q (RR)	0.67685	2.45113	18.67980
	SN->Q (FR)	0.63383	2.46397	20.24340
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.83141	2.68048	16.98600
	QN->Q (FR)	0.08482	1.35336	13.48360
	RN->Q (RR)	0.66971	2.54321	17.03640
	SN->Q (FR)	0.62629	2.55726	18.55620

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RF)	0.89027	2.85432	21.36550
	QN->Q (RF)	0.04771	0.91519	10.43860
	RN->Q (FF)	0.54890	2.58063	22.11120
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.92313	3.08273	20.20140
	QN->Q (RF)	0.04879	0.86831	9.17369
	RN->Q (FF)	0.58509	2.81436	20.92910

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RR)	0.79072	1.79758	10.30900
	RN->QN (FR)	0.45235	1.52648	11.05640
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.80842	1.95009	10.42730
	RN->QN (FR)	0.47221	1.68193	11.16650

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RF)	0.72594	1.53035	7.56627
	RN->QN (RF)	0.56389	1.39383	7.61307
	SN->QN (FF)	0.52351	1.41204	9.17894
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.69747	1.47463	6.61888
	RN->QN (RF)	0.53554	1.33918	6.66520
	SN->QN (FF)	0.49282	1.35310	8.17299

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.16810	-0.20288	-1.19814
	setup	CK (R)	0.63524	0.62236	1.77031
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.16917	-0.20372	-1.19705
	setup	CK (R)	0.63681	0.62316	1.77524

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.36751	-0.78569	-7.32396
	setup	CK (R)	0.46384	0.81934	7.39257
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.36771	-0.78475	-7.32264
	setup	CK (R)	0.46170	0.81534	7.38935

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.16810	-0.20288	-1.19814
	setup	CK (R)	0.63524	0.62236	1.77031
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.16917	-0.20372	-1.19705
	setup	CK (R)	0.63681	0.62316	1.77524

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.36751	-0.78569	-7.32396
	setup	CK (R)	0.46384	0.81934	7.39257
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.36771	-0.78475	-7.32264
	setup	CK (R)	0.46170	0.81534	7.38935

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.49793	0.49066	1.34171
	removal	CK (R)	-0.05469	-0.06050	-0.14716
	hold	SN (R)	-0.52075	-0.85621	-6.64947
	setup	SN (R)	0.55112	0.92763	8.33246
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.49729	0.49135	1.35110
	removal	CK (R)	-0.05469	-0.06050	-0.14716
	hold	SN (R)	-0.49522	-0.82981	-6.51637
	setup	SN (R)	0.55074	0.89842	8.20277

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.49793	0.49066	1.34171
	removal	CK (R)	-0.05469	-0.06050	-0.14716
	hold	SN (R)	-0.52301	-0.85666	-6.64947
	hold	SN (R)	-0.52075	-0.85621	-6.65946
	setup	SN (R)	0.55025	0.91958	8.28226
	setup	SN (R)	0.55112	0.92763	8.33246
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.49729	0.49135	1.35110
	removal	CK (R)	-0.05469	-0.06050	-0.14716
	hold	SN (R)	-0.50220	-0.82981	-6.51637
	hold	SN (R)	-0.49522	-0.83233	-6.52767
	setup	SN (R)	0.55074	0.89085	8.12867
	setup	SN (R)	0.52078	0.89842	8.20277

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	RN ()	0.35489	0.72667	13.33370
	min_pulse_width	RN ()	0.36309	0.72667	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.36103	0.72237	13.33370
	min_pulse_width	RN ()	0.35831	0.72237	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.09023	0.12047	1.05856
	removal	CK (R)	-0.02341	-0.06730	-0.72242
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.08822	0.12013	1.01489
	removal	CK (R)	-0.02341	-0.06730	-0.72437

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.09023	0.12047	1.05856
	removal	CK (R)	-0.02341	-0.06730	-0.72242
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.08822	0.12013	1.01489
	removal	CK (R)	-0.02341	-0.06730	-0.72437

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	SN ()	0.50948	0.90311	13.33370
	min_pulse_width	SN ()	0.51067	0.90526	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.50280	0.87299	13.33370
	min_pulse_width	SN ()	0.48312	0.87944	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.37923	0.61263	13.33370
	min_pulse_width	CK ()	0.49812	0.59326	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.36302	0.60832	13.33370
	min_pulse_width	CK ()	0.48927	0.59326	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.79852	0.81704	13.33370
	min_pulse_width	CK ()	0.41296	0.71806	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.79852	0.81704	13.33370
	min_pulse_width	CK ()	0.41026	0.71806	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00581	0.00531	0.00198
	RN	0.01056	0.01017	0.00674
	SN	-0.00066	-0.02446	-0.27206
	SN	0.01140	0.01109	0.00776
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00531	0.00490	0.00336
	RN	0.01006	0.00975	0.00810
	SN	-0.00066	-0.01820	-0.16617
	SN	0.01091	0.01067	0.00897

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00604	0.00582	0.00436
	RN	-0.00066	-0.02446	-0.27206
	RN	0.01223	0.01197	0.01041
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00553	0.00529	0.00418
	RN	-0.00066	-0.01820	-0.16617
	RN	0.01171	0.01143	0.01021

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00604	0.00581	0.00434
	RN	-0.00066	-0.02442	-0.27141
	RN	0.01223	0.01197	0.01038
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00553	0.00529	0.00419
	RN	-0.00066	-0.01813	-0.16509
	RN	0.01171	0.01143	0.01021

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00577	0.00528	0.00204
	RN	0.01053	0.01014	0.00679
	SN	-0.00066	-0.02442	-0.27139
	SN	0.01137	0.01106	0.00769
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00528	0.00486	0.00322
	RN	0.01003	0.00972	0.00798
	SN	-0.00066	-0.01813	-0.16508
	SN	0.01088	0.01064	0.00892

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00133	-0.00137	-0.00136
	(!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)	0.00686	0.00667	0.00651
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00260	0.00242	0.00228
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00260	0.00241	0.00228
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00263	0.00244	0.00231
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00133	-0.00137	-0.00136
	(!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)	0.00686	0.00667	0.00651
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00260	0.00242	0.00228
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00260	0.00241	0.00228
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00263	0.00244	0.00231

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00136	0.00137	0.00136
	(!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)	0.00993	0.00981	0.00960
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00440	0.00431	0.00428
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00442	0.00433	0.00429
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00438	0.00429	0.00425
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00136	0.00137	0.00136
	(!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)	0.00992	0.00981	0.00959
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00440	0.00431	0.00427
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00442	0.00433	0.00428
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00437	0.00428	0.00425

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00186	0.00159	0.00144
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00629	0.00590	0.00566
sky130_osu_sc_15T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00186	0.00159	0.00144
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00629	0.00590	0.00566

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00473	0.00456	0.00463
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00942	0.00909	0.00895
sky130_osu_sc_15T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00472	0.00455	0.00462
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00941	0.00909	0.00895

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00320	-0.00321	-0.00325
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00332	-0.00345	-0.00344
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00320	-0.00327	-0.00326
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00208	0.00185	0.00163
sky130_osu_sc_15T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00320	-0.00321	-0.00325
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00331	-0.00344	-0.00344
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00320	-0.00327	-0.00325
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00208	0.00185	0.00163

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00324	0.00328	0.00326
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00344	0.00345	0.00344
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00325	0.00329	0.00326
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00710	0.00694	0.00692
sky130_osu_sc_15T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00324	0.00328	0.00326
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00343	0.00344	0.00344
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00324	0.00329	0.00326
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00710	0.00693	0.00692

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00016	-0.00048	-0.00062
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00305	0.00262	0.00230
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00300	0.00258	0.00226
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00027	-0.00062	-0.00072
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00217	0.00156	0.00140
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00016	-0.00048	-0.00062
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00304	0.00262	0.00230
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00300	0.00258	0.00226
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00027	-0.00062	-0.00072
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00217	0.00156	0.00140

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01557	0.01516	0.01477
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00697	0.00675	0.00672
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01072	0.01054	0.01038
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01076	0.01058	0.01039
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01520	0.01474	0.01457
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00737	0.00716	0.00719
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00914	0.00874	0.00881
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01557	0.01516	0.01477
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00697	0.00675	0.00672
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01072	0.01054	0.01038
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01076	0.01058	0.01039
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01520	0.01473	0.01455
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00737	0.00716	0.00719
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00913	0.00873	0.00881

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00354	0.00641	0.01090	0.70146	0.71316
sky130_osu_sc_15T_ms__dffs_l	0.00354	0.00641	0.01090	0.45941	0.45902

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.06984	0.10671
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.04802	0.08490

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.60411	2.29499	17.50760
	QN->Q (FR)	0.07031	1.22243	13.53270
	SN->Q (FR)	0.47342	2.26770	19.12530
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.59571	2.41089	16.54710
	QN->Q (FR)	0.08474	1.35121	13.43310
	SN->Q (FR)	0.46220	2.38311	18.08570

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RF)	0.85486	2.80446	20.71710
	QN->Q (RF)	0.04794	0.89551	10.05330
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.87121	3.01788	20.02980
	QN->Q (RF)	0.04869	0.86580	9.14582

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RR)	0.75051	1.77022	10.28430
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.75615	1.89218	10.35280

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RF)	0.49682	1.25060	6.96231
	SN->QN (FF)	0.36337	1.22634	8.57143
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.47194	1.21471	6.26351
	SN->QN (FF)	0.33662	1.18815	7.79152

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.12610	-0.16533	-1.02264
	setup	CK (R)	0.43921	0.42839	1.64975
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12345	-0.16555	-1.02687
	setup	CK (R)	0.43741	0.43023	1.66019

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.32494	-0.74750	-7.06013
	setup	CK (R)	0.43159	0.78511	7.13927
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.32355	-0.74752	-7.05842
	setup	CK (R)	0.43160	0.78506	7.14040

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.12610	-0.16533	-1.02264
	setup	CK (R)	0.43921	0.42839	1.64975
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12345	-0.16555	-1.02687
	setup	CK (R)	0.43741	0.43023	1.66019

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.32494	-0.74750	-7.06013
	setup	CK (R)	0.43159	0.78511	7.13927
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.32355	-0.74752	-7.05842
	setup	CK (R)	0.43160	0.78506	7.14040

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.09735	0.12176	0.77399
	removal	CK (R)	-0.02468	-0.05617	-0.39785
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.09631	0.12026	0.74356
	removal	CK (R)	-0.02652	-0.05647	-0.39783

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.09735	0.12176	0.77399
	removal	CK (R)	-0.02468	-0.05617	-0.39785
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.09631	0.12026	0.74356
	removal	CK (R)	-0.02652	-0.05647	-0.39783

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	SN ()	0.34115	0.82350	13.33370
	min_pulse_width	SN ()	0.34738	0.82350	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.32712	0.79552	13.33370
	min_pulse_width	SN ()	0.32194	0.79768	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.24368	0.59326	13.33370
	min_pulse_width	CK ()	0.47821	0.59326	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.23262	0.59326	13.33370
	min_pulse_width	CK ()	0.46493	0.59326	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.59714	0.69654	13.33370
	min_pulse_width	CK ()	0.38347	0.68363	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.59714	0.69654	13.33370
	min_pulse_width	CK ()	0.38090	0.68363	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00480	0.00428	0.00128
	SN	-0.00066	-0.02339	-0.25252
	SN	0.00987	0.00946	0.00646
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00424	0.00378	0.00193
	SN	-0.00066	-0.01814	-0.16539
	SN	0.00931	0.00896	0.00724

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00521	0.00487	0.00254
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00465	0.00439	0.00329

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00521	0.00486	0.00249
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00465	0.00439	0.00330

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00477	0.00425	0.00132
	SN	-0.00066	-0.02362	-0.25672
	SN	0.00984	0.00943	0.00635
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00421	0.00375	0.00213
	SN	-0.00066	-0.01814	-0.16523
	SN	0.00927	0.00893	0.00722

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00136	-0.00139	-0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00531	0.00509	0.00484
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00226	0.00207	0.00193
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00136	-0.00139	-0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00531	0.00509	0.00484
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00226	0.00207	0.00193

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00138	0.00140	0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00852	0.00839	0.00827
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00419	0.00409	0.00406
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00138	0.00140	0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00852	0.00839	0.00827
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00419	0.00409	0.00406

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00234	-0.00234	-0.00236
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00180	0.00159	0.00152
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00234	-0.00236	-0.00236
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00180	0.00159	0.00152

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00237	0.00238	0.00237
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00507	0.00486	0.00483
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00237	0.00238	0.00237
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00507	0.00486	0.00483

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00018	-0.00050	-0.00063
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00034	-0.00069	-0.00079
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00182	0.00121	0.00105
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00018	-0.00050	-0.00063
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00034	-0.00069	-0.00079
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00182	0.00121	0.00105

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01396	0.01352	0.01313
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00696	0.00674	0.00670
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01378	0.01328	0.01323
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00741	0.00720	0.00723
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00889	0.00849	0.00856
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01396	0.01352	0.01313
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00696	0.00674	0.00670
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01378	0.01328	0.01323
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00741	0.00720	0.00723
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00889	0.00849	0.00856

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00370	0.01072	0.75048	0.75755
sky130_osu_sc_15T_ms__dff_l	0.00370	0.01070	0.42995	0.43515

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.08664	0.10663
sky130_osu_sc_15T_ms__dff_l	0.00000	0.06483	0.08482

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.49304	2.19744	18.06880
	QN->Q (FR)	0.06278	1.16977	13.14640
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.50779	2.29686	15.97160
	QN->Q (FR)	0.09231	1.39916	13.72020

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RF)	0.73597	2.67974	21.03450
	QN->Q (RF)	0.04750	0.91551	10.38100
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.78299	2.92515	19.49650
	QN->Q (RF)	0.04880	0.85334	8.91694

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.64155	1.63665	10.14970
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.66855	1.81642	10.26640

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RF)	0.39691	1.15291	7.15474
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.38638	1.10836	6.03684

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.11800	-0.16212	-1.04895
	setup	CK (R)	0.33236	0.32195	1.63988
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.11911	-0.16334	-1.05026
	setup	CK (R)	0.33095	0.32072	1.64206

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.31321	-0.75230	-7.15635
	setup	CK (R)	0.38190	0.79392	7.24432
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.31180	-0.75341	-7.15514
	setup	CK (R)	0.38138	0.79384	7.24817

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.20828	0.59326	13.33370
	min_pulse_width	CK ()	0.44945	0.59326	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.20164	0.59326	13.33370
	min_pulse_width	CK ()	0.43839	0.59326	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	**min_pulse_width**	**CK ()**	0.48866	0.67288	13.33370
	min_pulse_width	**CK ()**	0.31350	0.68794	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.48613	0.67288	13.33370
	min_pulse_width	**CK ()**	0.31350	0.68794	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00507	0.00449	0.00118
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00458	0.00410	0.00261

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00530	0.00506	0.00362
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00479	0.00447	0.00288

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00530	0.00506	0.00359
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00479	0.00447	0.00286

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00504	0.00446	0.00120
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00455	0.00406	0.00255

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00121	-0.00135	-0.00136
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00507	0.00485	0.00462
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00121	-0.00135	-0.00136
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00507	0.00486	0.00463

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00135	0.00137	0.00136
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00889	0.00874	0.00857
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00135	0.00137	0.00136
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00890	0.00874	0.00858

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00017	-0.00049	-0.00063
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00033	-0.00068	-0.00078
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00017	-0.00049	-0.00063
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00033	-0.00068	-0.00078

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00691	0.00670	0.00666
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.01370	0.01328	0.01289
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.01403	0.01351	0.01342
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00736	0.00715	0.00718
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00691	0.00670	0.00666
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.01370	0.01329	0.01289
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.01403	0.01351	0.01343
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00736	0.00715	0.00718

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__inv_1	5.49450
sky130_osu_sc_15T_ms__inv_10	27.47250
sky130_osu_sc_15T_ms__inv_2	7.93650
sky130_osu_sc_15T_ms__inv_3	10.37850
sky130_osu_sc_15T_ms__inv_4	12.82050
sky130_osu_sc_15T_ms__inv_6	17.70450
sky130_osu_sc_15T_ms__inv_8	22.58850
sky130_osu_sc_15T_ms__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00362	0.72133
sky130_osu_sc_15T_ms__inv_10	0.03320	6.78432
sky130_osu_sc_15T_ms__inv_2	0.00683	1.45770
sky130_osu_sc_15T_ms__inv_3	0.01016	2.11043
sky130_osu_sc_15T_ms__inv_4	0.01340	2.86768
sky130_osu_sc_15T_ms__inv_6	0.02007	4.25977
sky130_osu_sc_15T_ms__inv_8	0.02664	5.61477
sky130_osu_sc_15T_ms__inv_l	0.00274	0.43712

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.01317	0.02624
sky130_osu_sc_15T_ms__inv_10	0.00000	0.13166	0.26235
sky130_osu_sc_15T_ms__inv_2	0.00000	0.02633	0.05247
sky130_osu_sc_15T_ms__inv_3	0.00000	0.03950	0.07871
sky130_osu_sc_15T_ms__inv_4	0.00000	0.05266	0.10494
sky130_osu_sc_15T_ms__inv_6	0.00000	0.07900	0.15741
sky130_osu_sc_15T_ms__inv_8	0.00000	0.10533	0.20988
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00226	0.00438

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.06113	1.11811	12.42410
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.06741	0.76885	12.39050
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.04618	0.96753	12.47910
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.04873	0.90514	12.44870
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.04753	0.86173	12.54020
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.05164	0.81098	12.53170
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.05867	0.78865	12.51250
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.08372	1.29921	12.75540

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (RF)**	0.04309	0.83931	9.51166
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.05310	0.62902	9.54566
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.03445	0.75125	9.57206
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.03658	0.71993	9.63078
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.03559	0.69041	9.66472
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.04067	0.66396	9.68604
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.04647	0.64291	9.67181
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.04529	0.81691	8.53931

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00238	0.00235	0.00105
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02015	0.02024	0.00943
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00418	0.00418	0.00189
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00643	0.00638	0.00268
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00823	0.00821	0.00705
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01224	0.01168	0.00518
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01621	0.01626	0.00777
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00179	0.00175	0.00085

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00035	-0.00038	-0.00039
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00689	-0.00672	-0.00601
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00126	-0.00128	-0.00124
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00161	-0.00168	-0.00158
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00258	-0.00258	-0.00244
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00392	-0.00394	-0.00363
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00536	-0.00536	-0.00483
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00022	-0.00025	-0.00026

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_15T_ms__mux2_1	0.33700	0.33823	0.00742	0.65013

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.02638	0.02638

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.03824	0.78650	8.92904
	A1->Y (RR)	-	0.04407	0.79759	8.94876
	S0->Y (RR)	(!A0 * A1)	0.11064	0.92853	8.18777
	S0->Y (FR)	(A0 * !A1)	0.07015	0.99125	9.56936

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (FF)	-	0.03788	0.72185	8.15190
	A1->Y (FF)	-	0.03282	0.71657	8.13417
	S0->Y (FF)	(!A0 * A1)	0.14951	0.89641	7.10212
	S0->Y (RF)	(A0 * !A1)	0.04725	0.79672	8.24816

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00245	-0.00246	-0.00246
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00171	-0.00171	-0.00171
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00306	0.00287	0.00297
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00150	-0.00181	-0.00183

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00245	0.00246	0.00246
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00171	0.00171	0.00171
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00059	0.00029	0.00028
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00631	0.00612	0.00620

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00066	-0.00065	-0.00065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00066	0.00065	0.00065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00077	-0.00077	-0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00077	0.00077	0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00046	-0.00078	-0.00079
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00044	-0.00076	-0.00078

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00482	0.00464	0.00470
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00455	0.00436	0.00445

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00363	0.00359	0.72432
sky130_osu_sc_15T_ms__nand2_l	0.00274	0.00273	0.43183

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.01318	0.05247
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00227	0.00876

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.06387	1.12655	12.52930
	B->Y (FR)	0.07335	1.12582	12.38770
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.08603	1.29767	12.72490
	B->Y (FR)	0.09962	1.31137	12.69950

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (RF)	0.07213	1.14462	12.58320
	B->Y (RF)	0.08123	1.15651	12.57130
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.07583	1.09855	10.80260
	B->Y (RF)	0.08403	1.11029	10.74690

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00251	0.00248	0.00249
	B	0.00000	0.00000	0.00000
	B	0.00308	0.00304	0.00179
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00186	0.00184	0.00156
	B	0.00000	0.00000	0.00000
	B	0.00228	0.00224	0.00143

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00019	-0.00023	-0.00023
	B	0.00000	0.00000	0.00000
	B	-0.00017	-0.00021	-0.00022
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00013	-0.00016	-0.00017
	B	0.00000	0.00000	0.00000
	B	-0.00012	-0.00015	-0.00016

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00158	-0.00159	-0.00160
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00110	-0.00111	-0.00112

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00160	0.00162	0.00161
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00111	0.00113	0.00112

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00146	-0.00147	-0.00146
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00102	-0.00102	-0.00102

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00146	0.00149	0.00147
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00103	0.00103	0.00103

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00360	0.00389	0.33098
sky130_osu_sc_15T_ms__nor2_l	0.00264	0.00296	0.20850

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.01020	0.02624
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00187	0.00438

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.15913	1.47910	12.85020
	B->Y (FR)	0.13095	1.39964	12.43550
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.19733	1.67581	12.81540
	B->Y (FR)	0.17308	1.60984	12.55850

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (RF)	0.05353	0.71754	7.23874
	B->Y (RF)	0.04539	0.70656	7.21830
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.05318	0.70098	6.63886
	B->Y (RF)	0.04743	0.69272	6.62169

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00317	0.00311	0.00271
	B	0.00000	0.00000	0.00000
	B	0.00261	0.00255	0.00255
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00226	0.00223	0.00202
	B	0.00000	0.00000	0.00000
	B	0.00193	0.00187	0.00186

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00039	0.00028	0.00023
	B	0.00000	0.00000	0.00000
	B	-0.00029	-0.00031	-0.00036
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00024	0.00018	0.00014
	B	0.00000	0.00000	0.00000
	B	-0.00016	-0.00018	-0.00022

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00122	-0.00137	-0.00137
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00084	-0.00092	-0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00136	0.00138	0.00137
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00091	0.00092	0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00081	-0.00081	-0.00080
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00053	-0.00053	-0.00052

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00087	0.00087	0.00082
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00056	0.00056	0.00054

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00361	0.00368	0.00312	0.32927

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.00678	0.03062

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.17666	1.46314	12.57120
	A1->Y (FR)	0.21194	1.54881	13.02330
	B0->Y (FR)	0.10322	1.16560	10.85370

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (RF)	0.09628	0.93513	8.61188
	A1->Y (RF)	0.11038	0.93138	8.49921
	B0->Y (RF)	0.07819	0.92042	8.75387

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00341	0.00334	0.00333
	A1	0.00000	0.00000	0.00000
	A1	0.00400	0.00395	0.00391
	B0	0.00271	0.00265	0.00264

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00020	0.00017	0.00013
	A1	0.00000	0.00000	0.00000
	A1	0.00090	0.00080	0.00075
	B0	0.00122	0.00117	0.00112

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00080	-0.00081	-0.00081
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00136	-0.00138	-0.00138
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00142	-0.00142	-0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00087	0.00087	0.00083
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00137	0.00138	0.00138
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00142	0.00144	0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00119	-0.00134	-0.00134
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00134	-0.00137	-0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00139	-0.00140	-0.00140

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00133	0.00135	0.00134
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00136	0.00137	0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00139	0.00142	0.00140

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00112	-0.00113	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00116	0.00119	0.00117

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00347	0.00371	0.00384	0.00375	0.32987

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.01531	0.05247

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.23053	1.55701	12.94330
	A1->Y (FR)	0.19972	1.47487	12.50090
	B0->Y (FR)	0.14297	1.41192	12.44010
	B1->Y (FR)	0.17497	1.49454	12.87230

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (RF)	0.14488	0.99805	8.71175
	A1->Y (RF)	0.12197	0.96781	8.65388
	B0->Y (RF)	0.10283	0.95072	8.79192
	B1->Y (RF)	0.12713	0.98206	8.86386

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00510	0.00505	0.00501
	A1	0.00448	0.00441	0.00439
	B0	0.00334	0.00328	0.00327
	B1	0.00398	0.00393	0.00359

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00135	0.00125	0.00119
	A1	0.00070	0.00066	0.00060
	B0	0.00071	0.00066	0.00059
	B1	0.00137	0.00126	0.00119

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00122	-0.00137	-0.00137
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00121	-0.00137	-0.00137
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00134	-0.00138	-0.00137
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00140	-0.00141	-0.00140

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00136	0.00138	0.00137
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00136	0.00138	0.00137
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00136	0.00138	0.00137
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00141	0.00142	0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00080	-0.00080	-0.00080
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00080	-0.00080	-0.00080
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00132	-0.00135	-0.00135
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00139	-0.00140	-0.00139

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00086	0.00086	0.00082
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00086	0.00086	0.00082
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00135	0.00135	0.00135
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00139	0.00140	0.00139

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00079	-0.00080	-0.00079
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00080	-0.00080	-0.00079
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00151	-0.00155	-0.00153
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00151	-0.00152	-0.00157

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00085	0.00086	0.00081
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00085	0.00086	0.00081
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00153	0.00155	0.00153
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00157	0.00160	0.00158

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00119	-0.00134	-0.00134
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00119	-0.00134	-0.00134
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00155	-0.00159	-0.00158
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00154	-0.00155	-0.00160

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00134	0.00135	0.00134
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00134	0.00134	0.00134
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00157	0.00159	0.00158
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00161	0.00162	0.00161

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00395	0.00372	0.73196
sky130_osu_sc_15T_ms__or2_2	0.00395	0.00372	1.45373
sky130_osu_sc_15T_ms__or2_4	0.00395	0.00371	2.83845
sky130_osu_sc_15T_ms__or2_8	0.00395	0.00372	5.58168
sky130_osu_sc_15T_ms__or2_l	0.00305	0.00280	0.43475

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.01684	0.02643
sky130_osu_sc_15T_ms__or2_2	0.00000	0.02347	0.05266
sky130_osu_sc_15T_ms__or2_4	0.00000	0.03673	0.10514
sky130_osu_sc_15T_ms__or2_8	0.00000	0.06326	0.21008
sky130_osu_sc_15T_ms__or2_l	0.00000	0.00307	0.00466

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.14416	1.13332	9.46713
	B->Y (RR)	0.13142	1.10313	9.26927
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.15794	1.03138	9.71363
	B->Y (RR)	0.14461	1.00689	9.56038
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.20981	1.01492	10.19670
	B->Y (RR)	0.19606	0.99554	10.08750
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.31142	1.07887	10.93610
	B->Y (RR)	0.29708	1.06411	10.85400
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.16231	1.28591	9.41136
	B->Y (RR)	0.15073	1.25656	9.22769

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (FF)	0.32422	1.17321	8.42025
	B->Y (FF)	0.28320	1.09395	7.72003
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.40262	1.20380	8.84054
	B->Y (FF)	0.36146	1.12168	8.24037
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.58629	1.37876	9.55309
	B->Y (FF)	0.54514	1.29299	9.03235
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.94835	1.77706	10.46620
	B->Y (FF)	0.90699	1.68668	10.05700
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.37892	1.20223	7.55845
	B->Y (FF)	0.33151	1.12511	6.98871

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00266	0.00241	0.00235
	B	0.00000	0.00000	0.00000
	B	0.00198	0.00175	0.00178
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00443	0.00430	0.00422
	B	0.00000	0.00000	0.00000
	B	0.00373	0.00366	0.00369
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00833	0.00847	0.00840
	B	0.00000	0.00000	0.00000
	B	0.00763	0.00786	0.00788
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01605	0.01649	0.01715
	B	0.00000	0.00000	0.00000
	B	0.01532	0.01587	0.01682
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00192	0.00174	0.00169
	B	0.00000	0.00000	0.00000
	B	0.00149	0.00132	0.00133

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00544	0.00539	0.00534
	B	0.00000	0.00000	0.00000
	B	0.00469	0.00466	0.00475
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00661	0.00686	0.00682
	B	0.00000	0.00000	0.00000
	B	0.00587	0.00609	0.00618
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00957	0.01031	0.01039
	B	0.00000	0.00000	0.00000
	B	0.00882	0.00952	0.00971
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01546	0.01693	0.01757
	B	0.00000	0.00000	0.00000
	B	0.01471	0.01613	0.01682
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00398	0.00394
	B	0.00000	0.00000	0.00000
	B	0.00354	0.00348	0.00354

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00124	-0.00139	-0.00138
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00123	-0.00139	-0.00138
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00123	-0.00139	-0.00138
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00123	-0.00139	-0.00138
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00084	-0.00093	-0.00093

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00138	0.00139	0.00138
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00138	0.00139	0.00138
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00138	0.00139	0.00138
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00138	0.00139	0.00138
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00092	0.00093	0.00093

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00081	-0.00081
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00081	-0.00081
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00081	-0.00081
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00081	-0.00081
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00054	-0.00054	-0.00054

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00087	0.00088	0.00083
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00087	0.00088	0.00083
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00087	0.00088	0.00083
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00087	0.00088	0.00083
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00058	0.00058	0.00055

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00387	0.00499	0.33254
sky130_osu_sc_15T_ms__tbufi_l	0.00296	0.00386	0.20843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.01324	0.05247
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00236	0.00876

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.12265	1.39128	12.42930
	OE->Y (FR)	0.08800	0.49918	3.47409
	OE->Y (RR)	0.19606	1.40720	9.54394
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.16484	1.60364	12.55430
	OE->Y (FR)	0.10528	0.53320	3.47398
	OE->Y (RR)	0.22807	1.59070	9.36603

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.06957	0.88663	8.55670
	OE->Y (FF)	0.08919	0.50274	3.47402
	OE->Y (RF)	0.06872	0.88744	8.49255
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.07466	0.86803	7.80423
	OE->Y (FF)	0.10760	0.53550	3.47399
	OE->Y (RF)	0.07205	0.86627	7.69171

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00241	0.00235	0.00234
	OE	0.00000	0.00000	0.00000
	OE	0.00229	0.00198	0.00201
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00179	0.00173	0.00171
	OE	0.00000	0.00000	0.00000
	OE	0.00163	0.00140	0.00142

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00029	-0.00031	-0.00036
	OE	0.00000	0.00000	0.00000
	OE	0.00165	0.00135	0.00136
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00016	-0.00018	-0.00022
	OE	0.00000	0.00000	0.00000
	OE	0.00112	0.00089	0.00090

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00124	-0.00125	-0.00125
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00115	-0.00116	-0.00115
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00090	-0.00090	-0.00089
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00083	-0.00083	-0.00083

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00124	0.00125	0.00125
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00120	0.00121	0.00118
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00090	0.00090	0.00089
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00086	0.00086	0.00084

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00093	0.00063	0.00066
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00083	0.00053	0.00054
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00062	0.00039	0.00041
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00055	0.00031	0.00033

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00284	0.00257	0.00264
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00288	0.00264	0.00269
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00219	0.00199	0.00203
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00224	0.00205	0.00208

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tnbufi_1	0.00386	0.00585	0.33197
sky130_osu_sc_15T_ms__tnbufi_l	0.00296	0.00425	0.20843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.02196	0.02634
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.00378	0.00452

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (FR)	0.12416	1.39036	12.41700
	OE->Y (RR)	0.04894	0.35635	3.47371
	OE->Y (FR)	0.14358	1.46060	12.84010
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.16613	1.60338	12.55320
	OE->Y (RR)	0.04841	0.34168	3.47368
	OE->Y (FR)	0.17981	1.65950	12.81940

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (RF)	0.06815	0.88565	8.55068
	OE->Y (RF)	0.04834	0.35593	3.47369
	OE->Y (FF)	0.13579	0.95711	6.37497
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.07284	0.86732	7.80364
	OE->Y (RF)	0.04754	0.34166	3.47357
	OE->Y (FF)	0.15661	0.97875	5.92088

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00248	0.00243	0.00242
	OE	0.00000	0.00000	0.00000
	OE	0.00580	0.00564	0.00561
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00186	0.00180	0.00178
	OE	0.00000	0.00000	0.00000
	OE	0.00422	0.00410	0.00411

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00038	-0.00040	-0.00045
	OE	0.00000	0.00000	0.00000
	OE	0.00525	0.00510	0.00524
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00025	-0.00027	-0.00032
	OE	0.00000	0.00000	0.00000
	OE	0.00378	0.00365	0.00374

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00106	-0.00107	-0.00106
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00097	-0.00098	-0.00097
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00072	-0.00072	-0.00072
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00065	-0.00066	-0.00066

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00106	0.00107	0.00106
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00101	0.00102	0.00100
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00072	0.00072	0.00072
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00068	0.00068	0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00152	-0.00196	-0.00195
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00152	-0.00193	-0.00194
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00098	-0.00129	-0.00127
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00096	-0.00126	-0.00126

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00443	0.00429	0.00443
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00435	0.00419	0.00433
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00321	0.00308	0.00317
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00315	0.00303	0.00312

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00765	0.00672	0.33720

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.04618	0.07880

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.25166	1.48375	9.84863
	A->Y (FR)	!B	0.16145	1.44185	12.54820
	B->Y (RR)	A	0.20675	1.43183	9.71899
	B->Y (FR)	!A	0.19520	1.51936	12.98550

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.21489	1.07501	6.90040
	A->Y (RF)	!B	0.09671	0.91340	8.55455
	B->Y (FF)	A	0.19532	1.05076	6.86910
	B->Y (RF)	!A	0.11097	0.93362	8.57840

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00227	0.00195	0.00190
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00599	0.00573	0.00582
	B	A	0.00000	0.00000	0.00000
	B	A	0.00116	0.00089	0.00088
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00626	0.00605	0.00614

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00730	0.00701	0.00699
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00169	0.00136	0.00132
	B	A	0.00000	0.00000	0.00000
	B	A	0.00651	0.00638	0.00645
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00233	0.00196	0.00189

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00770	0.00678	0.32896

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.04618	0.07897

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.24982	1.46692	9.65941
	A->Y (FR)	B	0.18644	1.49756	12.83850
	B->Y (RR)	!A	0.21385	1.43480	9.62839
	B->Y (FR)	A	0.20005	1.51808	12.87100

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (FF)	!B	0.20999	1.06301	6.88671
	A->Y (RF)	B	0.09387	0.91794	8.55782
	B->Y (FF)	!A	0.19480	1.04421	6.79867
	B->Y (RF)	A	0.10611	0.92772	8.49773

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00684	0.00660	0.00637
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00147	0.00098	0.00090
	B	A	0.00000	0.00000	0.00000
	B	A	0.00691	0.00670	0.00658
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00107	0.00080	0.00078

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00162	0.00120	0.00111
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00742	0.00722	0.00727
	B	A	0.00000	0.00000	0.00000
	B	A	0.00163	0.00125	0.00119
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00664	0.00653	0.00659

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.14378
sky130_osu_sc_15T_ms__tiehi	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__ant	0.00000	45307.00000	90614.00000
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	-0.00134	0.00779	0.10490

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	0.78973	0.73828	0.14167