sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs Library

Cell Groups
SKY130_OSU_SC_12T_MS__ADDFx
SKY130_OSU_SC_12T_MS__ADDHx
SKY130_OSU_SC_12T_MS__AND2x
SKY130_OSU_SC_12T_MS__AOI21
SKY130_OSU_SC_12T_MS__AOI22
SKY130_OSU_SC_12T_MS__BUFx
SKY130_OSU_SC_12T_MS__DFFNRx
SKY130_OSU_SC_12T_MS__DFFRx
SKY130_OSU_SC_12T_MS__DFFSRx
SKY130_OSU_SC_12T_MS__DFFSx
SKY130_OSU_SC_12T_MS__DFFx
SKY130_OSU_SC_12T_MS__INVx
SKY130_OSU_SC_12T_MS__MUX2
SKY130_OSU_SC_12T_MS__NAND2x
SKY130_OSU_SC_12T_MS__NOR2x
SKY130_OSU_SC_12T_MS__OAI21
SKY130_OSU_SC_12T_MS__OAI22
SKY130_OSU_SC_12T_MS__OR2x
SKY130_OSU_SC_12T_MS__TBUFIx
SKY130_OSU_SC_12T_MS__TNBUFIx
SKY130_OSU_SC_12T_MS__XNOR2
SKY130_OSU_SC_12T_MS__XOR2
SKY130_OSU_SC_12T_MS_x

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	**B**	**CI**	**CO**	**CON**	**S**
sky130_osu_sc_12T_ms__addf_1	0.00991	0.00997	0.00782	0.18632	0.06982	0.17655
sky130_osu_sc_12T_ms__addf_l	0.00991	0.00997	0.00782	0.16191	0.07039	0.17654

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.00024	0.00025
sky130_osu_sc_12T_ms__addf_l	0.00000	0.00024	0.00025

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.59251	3.10865	21.37800
	B->CO (RR)	0.57294	3.03934	21.09470
	CI->CO (RR)	0.56815	3.08641	21.48040
	CON->CO (FR)	0.14522	1.58989	13.57760
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.54908	2.94448	19.73050
	B->CO (RR)	0.53115	2.88524	19.52240
	CI->CO (RR)	0.52463	2.92337	19.83310
	CON->CO (FR)	0.14022	1.58066	13.04360

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	1.71679	6.85160	42.31080
	B->CO (FF)	1.60727	6.65824	41.60120
	CI->CO (FF)	1.58442	6.65822	41.74090
	CON->CO (RF)	0.05286	0.79848	7.94900
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	1.68193	6.67244	39.47010
	B->CO (FF)	1.57393	6.49499	38.84330
	CI->CO (FF)	1.55041	6.47734	38.89810
	CON->CO (RF)	0.06428	0.90562	8.57254

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (FR)	1.12952	2.95313	14.41780
	B->CON (FR)	1.03566	2.82616	14.19210
	CI->CON (FR)	0.99819	2.75741	13.87530
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	1.07991	2.90906	14.42520
	B->CON (FR)	0.98740	2.78313	14.19660
	CI->CON (FR)	0.94879	2.71384	13.88030

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (RF)	0.25534	1.00267	7.16865
	B->CON (RF)	0.24362	0.98274	7.23113
	CI->CON (RF)	0.23097	0.98092	7.28807
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.24491	0.99335	7.17219
	B->CON (RF)	0.23355	0.97412	7.23333
	CI->CON (RF)	0.22054	0.97252	7.29032

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-R)	2.24965	7.39491	40.35930
	B->S (-R)	2.17187	7.24872	39.89920
	CI->S (-R)	2.10902	7.18525	39.75110
	CON->S (RR)	0.35050	1.76135	11.33890
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	2.14955	7.31507	40.29020
	B->S (-R)	2.07615	7.16982	39.83700
	CI->S (-R)	2.00954	7.10530	39.68060
	CON->S (RR)	0.35056	1.76165	11.33860

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-F)	1.32250	3.21413	16.11040
	B->S (-F)	1.43304	3.21799	15.86030
	CI->S (-F)	1.29689	3.17997	16.20050
	CON->S (FF)	0.66016	1.54159	8.91721
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	1.29985	3.19321	16.09180
	B->S (-F)	1.41022	3.19681	15.84290
	CI->S (-F)	1.27374	3.15888	16.17420
	CON->S (FF)	0.66041	1.54162	8.91726

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00134	0.00133	0.00129
	B	0.00148	0.00152	0.00149
	CI	0.00158	0.00161	0.00159
sky130_osu_sc_12T_ms__addf_l	A	0.00121	0.00119	0.00115
	B	0.00134	0.00137	0.00135
	CI	0.00145	0.00147	0.00145

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00423	0.00422	0.00420
	B	0.00419	0.00420	0.00417
	CI	0.00365	0.00372	0.00368
sky130_osu_sc_12T_ms__addf_l	A	0.00412	0.00410	0.00408
	B	0.00408	0.00408	0.00405
	CI	0.00353	0.00359	0.00356

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00423	0.00421	0.00417
	B	0.00419	0.00419	0.00414
	CI	0.00365	0.00368	0.00367
sky130_osu_sc_12T_ms__addf_l	A	0.00412	0.00410	0.00406
	B	0.00408	0.00407	0.00403
	CI	0.00353	0.00357	0.00354

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00133	0.00132	0.00126
	B	0.00147	0.00150	0.00141
	CI	0.00158	0.00161	0.00156
sky130_osu_sc_12T_ms__addf_l	A	0.00119	0.00118	0.00112
	B	0.00133	0.00136	0.00128
	CI	0.00144	0.00147	0.00141

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00423	0.00422	0.00420
	B	0.00420	0.00420	0.00418
	CI	0.00365	0.00372	0.00369
sky130_osu_sc_12T_ms__addf_l	A	0.00412	0.00411	0.00408
	B	0.00408	0.00409	0.00404
	CI	0.00354	0.00360	0.00357

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00838	0.00840	0.00833
	B	0.00794	0.00789	0.00773
	CI	0.00688	0.00686	0.00683
sky130_osu_sc_12T_ms__addf_l	A	0.00838	0.00840	0.00833
	B	0.00795	0.00789	0.00773
	CI	0.00688	0.00686	0.00683

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00483	0.00507	0.18590	0.18537	0.18667
sky130_osu_sc_12T_ms__addh_l	0.00485	0.00508	0.15934	0.18595	0.16078

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.00021	0.00025
sky130_osu_sc_12T_ms__addh_l	0.00000	0.00021	0.00024

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (RR)	0.44055	1.82485	11.48750
	B->CO (RR)	0.44576	1.82758	11.65390
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.40023	1.78482	10.98710
	B->CO (RR)	0.40563	1.78709	11.18040

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (FF)	0.51295	1.36676	8.91270
	B->CO (FF)	0.53089	1.38435	8.96916
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.50122	1.44062	9.42542
	B->CO (FF)	0.51925	1.46307	9.48180

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (RR)	0.64977	1.99493	11.53890
	B->CON (RR)	0.65460	1.99570	11.70050
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.60610	1.95355	11.44400
	B->CON (RR)	0.61096	1.95385	11.62710

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (FF)	0.59659	1.41435	8.94727
	B->CON (FF)	0.60703	1.42702	8.99304
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.54614	1.35933	8.81878
	B->CON (FF)	0.55720	1.37687	8.86706

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (FR)	0.85739	2.87431	18.27330
	B->S (FR)	0.86867	2.88571	18.34110
	CON->S (FR)	0.14686	1.59419	13.63810
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.78492	2.73925	17.13580
	B->S (FR)	0.79634	2.75547	17.19210
	CON->S (FR)	0.13892	1.56858	12.99010

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (RF)	0.94237	3.44776	20.54870
	B->S (RF)	0.94723	3.44591	20.70710
	CON->S (RF)	0.05227	0.79884	7.96581
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.90476	3.37912	19.41260
	B->S (RF)	0.90942	3.38383	19.58000
	CON->S (RF)	0.06305	0.90413	8.56911

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00217	0.00213	0.00207
	B	0.00000	0.00000	0.00000
	B	0.00208	0.00204	0.00197
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00191	0.00186	0.00179
	B	0.00000	0.00000	0.00000
	B	0.00181	0.00176	0.00170

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00303	0.00300	0.00286
	B	0.00000	0.00000	0.00000
	B	0.00315	0.00317	0.00306
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00277	0.00272	0.00264
	B	0.00000	0.00000	0.00000
	B	0.00288	0.00290	0.00283

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00218	0.00213	0.00207
	B	0.00000	0.00000	0.00000
	B	0.00208	0.00204	0.00197
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00192	0.00186	0.00179
	B	0.00000	0.00000	0.00000
	B	0.00182	0.00176	0.00170

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00303	0.00300	0.00287
	B	0.00000	0.00000	0.00000
	B	0.00315	0.00317	0.00306
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00276	0.00272	0.00260
	B	0.00000	0.00000	0.00000
	B	0.00289	0.00290	0.00279

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00304	0.00301	0.00296
	B	0.00000	0.00000	0.00000
	B	0.00316	0.00318	0.00315
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00277	0.00273	0.00268
	B	0.00000	0.00000	0.00000
	B	0.00289	0.00290	0.00287

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00217	0.00213	0.00207
	B	0.00000	0.00000	0.00000
	B	0.00208	0.00204	0.00198
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00191	0.00186	0.00180
	B	0.00000	0.00000	0.00000
	B	0.00181	0.00176	0.00170

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.08505	0.07946	0.01516
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.08506	0.07947	0.01517

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.08495	0.07894	0.01303
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.08496	0.07895	0.01304

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__and2_1	8.30280
sky130_osu_sc_12T_ms__and2_2	10.25640
sky130_osu_sc_12T_ms__and2_4	14.16360
sky130_osu_sc_12T_ms__and2_6	18.07080
sky130_osu_sc_12T_ms__and2_8	21.97800
sky130_osu_sc_12T_ms__and2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00260	0.00268	0.18448
sky130_osu_sc_12T_ms__and2_2	0.00260	0.00268	0.37741
sky130_osu_sc_12T_ms__and2_4	0.00260	0.00268	0.73699
sky130_osu_sc_12T_ms__and2_6	0.00263	0.00267	1.08736
sky130_osu_sc_12T_ms__and2_8	0.00260	0.00268	1.42913
sky130_osu_sc_12T_ms__and2_l	0.00197	0.00203	0.15828

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.00008	0.00011
sky130_osu_sc_12T_ms__and2_2	0.00000	0.00012	0.00014
sky130_osu_sc_12T_ms__and2_4	0.00000	0.00019	0.00021
sky130_osu_sc_12T_ms__and2_6	0.00000	0.00027	0.00028
sky130_osu_sc_12T_ms__and2_8	0.00000	0.00034	0.00036
sky130_osu_sc_12T_ms__and2_l	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	A->Y (RR)	0.33829	1.70308	10.98920
	B->Y (RR)	0.35041	1.71203	11.22830
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.37036	1.55246	11.45890
	B->Y (RR)	0.38239	1.56044	11.65190
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.51028	1.55341	11.96390
	B->Y (RR)	0.52227	1.56406	12.07410
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.65660	1.64708	12.33560
	B->Y (RR)	0.66836	1.65934	12.38840
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.79663	1.76111	12.65230
	B->Y (RR)	0.80886	1.77895	12.66830
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.33709	1.71132	10.73610
	B->Y (RR)	0.34908	1.72098	10.98010

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	**A->Y (FF)**	0.37794	1.19371	8.39298
	B->Y (FF)	0.39844	1.21456	8.47658
sky130_osu_sc_12T_ms__and2_2	**A->Y (FF)**	0.47861	1.26917	8.79672
	B->Y (FF)	0.49682	1.29280	8.85474
sky130_osu_sc_12T_ms__and2_4	**A->Y (FF)**	0.71396	1.50717	9.35228
	B->Y (FF)	0.72535	1.52168	9.38769
sky130_osu_sc_12T_ms__and2_6	**A->Y (FF)**	0.95333	1.76698	9.76590
	B->Y (FF)	0.95787	1.77793	9.78386
sky130_osu_sc_12T_ms__and2_8	**A->Y (FF)**	1.17972	2.01977	10.09450
	B->Y (FF)	1.17871	2.01857	10.10310
sky130_osu_sc_12T_ms__and2_l	**A->Y (FF)**	0.33817	1.21786	8.36552
	B->Y (FF)	0.36012	1.23870	8.43234

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00159	0.00151	0.00143
	B	0.00000	0.00000	0.00000
	B	0.00162	0.00155	0.00147
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00288	0.00287	0.00280
	B	0.00000	0.00000	0.00000
	B	0.00291	0.00293	0.00285
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00585	0.00603	0.00602
	B	0.00000	0.00000	0.00000
	B	0.00588	0.00608	0.00611
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00883	0.00918	0.00924
	B	0.00000	0.00000	0.00000
	B	0.00887	0.00924	0.00932
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01177	0.01223	0.01234
	B	0.00000	0.00000	0.00000
	B	0.01182	0.01229	0.01246
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00123	0.00117	0.00111
	B	0.00000	0.00000	0.00000
	B	0.00125	0.00119	0.00114

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00381	0.00372	0.00365
	B	0.00000	0.00000	0.00000
	B	0.00424	0.00415	0.00408
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00476	0.00482	0.00476
	B	0.00000	0.00000	0.00000
	B	0.00520	0.00526	0.00518
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00718	0.00750	0.00747
	B	0.00000	0.00000	0.00000
	B	0.00762	0.00792	0.00788
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00967	0.01024	0.01030
	B	0.00000	0.00000	0.00000
	B	0.01010	0.01064	0.01069
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01202	0.01279	0.01299
	B	0.00000	0.00000	0.00000
	B	0.01245	0.01319	0.01337
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00286	0.00280	0.00274
	B	0.00000	0.00000	0.00000
	B	0.00316	0.00308	0.00303

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00122	-0.00123	-0.00123
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00123	-0.00123	-0.00123
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00123	-0.00123	-0.00123
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00124	-0.00124	-0.00124
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00123	-0.00123	-0.00123
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00085	-0.00086	-0.00086

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00123	0.00124	0.00123
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00123	0.00124	0.00123
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00123	0.00124	0.00123
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00125	0.00125	0.00125
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00123	0.00123	0.00123
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00086	0.00087	0.00086

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00116	-0.00116	-0.00116
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00116	-0.00116	-0.00116
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00116	-0.00116	-0.00116
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00116	-0.00116	-0.00116
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00116	-0.00117	-0.00116
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00082	-0.00082	-0.00082

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00116	0.00117	0.00116
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00116	0.00117	0.00116
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00116	0.00117	0.00116
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00116	0.00117	0.00116
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00116	0.00117	0.00116
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00082	0.00082	0.00082

SKY130_OSU_SC_12T_MS__AOI21

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_12T_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**B0**	**Y**
sky130_osu_sc_12T_ms__aoi21_l	0.00229	0.00250	0.00250	0.07330

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00005	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (FR)	0.55480	2.45042	14.32940
	A1->Y (FR)	0.47475	2.30986	13.97470
	B0->Y (FR)	0.46849	2.29479	13.81780

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (RF)	0.12035	0.86895	7.08072
	A1->Y (RF)	0.11205	0.85888	7.15979
	B0->Y (RF)	0.07513	0.77641	7.02649

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00276	0.00271	0.00269
	A1	0.00000	0.00000	0.00000
	A1	0.00237	0.00232	0.00229
	B0	0.00245	0.00239	0.00237

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00036	0.00031	0.00025
	A1	0.00000	0.00000	0.00000
	A1	0.00036	0.00031	0.00025
	B0	-0.00021	-0.00021	-0.00025

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00094	-0.00096	-0.00096
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00099	-0.00099	-0.00099
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00099	-0.00100	-0.00099

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00096	0.00096	0.00096
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00099	0.00100	0.00100
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00099	0.00100	0.00100

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00095	-0.00097	-0.00096
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00099	-0.00100	-0.00099
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00110	-0.00111	-0.00111

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00096	0.00098	0.00096
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00099	0.00100	0.00100
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00112	0.00112	0.00111

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00064	-0.00065	-0.00064

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00070	0.00071	0.00066

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_1	0.00229	0.00250	0.00266	0.00245	0.07290

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (FR)	0.69907	2.59984	14.46400
	A1->Y (FR)	0.63061	2.51790	14.35950
	B0->Y (FR)	0.49813	2.28389	13.79970
	B1->Y (FR)	0.56676	2.39531	13.90560

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (RF)	0.14559	0.89693	7.10831
	A1->Y (RF)	0.13723	0.88757	7.18929
	B0->Y (RF)	0.10256	0.83808	7.12264
	B1->Y (RF)	0.11096	0.85347	7.04490

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00338	0.00333	0.00329
	A1	0.00300	0.00294	0.00289
	B0	0.00263	0.00248	0.00251
	B1	0.00301	0.00295	0.00292

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00081	0.00077	0.00069
	A1	0.00081	0.00077	0.00069
	B0	-0.00010	-0.00011	-0.00014
	B1	-0.00011	-0.00010	-0.00014

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00094	-0.00096	-0.00096
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00099	-0.00100	-0.00099
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00099	-0.00100	-0.00099
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00099	-0.00100	-0.00099

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00095	0.00096	0.00096
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00099	0.00100	0.00100
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00099	0.00100	0.00099
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00099	0.00100	0.00099

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00095	-0.00097	-0.00096
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00100	-0.00100	-0.00100
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00110	-0.00110	-0.00111
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00110	-0.00110	-0.00111

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00096	0.00097	0.00096
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00100	0.00100	0.00100
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00111	0.00111	0.00111
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00111	0.00111	0.00111

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00064	-0.00064	-0.00064
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00063	-0.00064	-0.00064
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00115	-0.00117	-0.00117
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00115	-0.00117	-0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00069	0.00070	0.00065
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00063	0.00064	0.00064
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00116	0.00118	0.00117
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00116	0.00118	0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00065	-0.00065	-0.00065
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00064	-0.00065	-0.00065
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00105	-0.00106	-0.00106
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00105	-0.00106	-0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00071	0.00070	0.00066
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00064	0.00065	0.00065
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00105	0.00106	0.00106
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00105	0.00106	0.00106

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__buf_1	6.34920
sky130_osu_sc_12T_ms__buf_2	8.30280
sky130_osu_sc_12T_ms__buf_4	12.21000
sky130_osu_sc_12T_ms__buf_6	16.11720
sky130_osu_sc_12T_ms__buf_8	20.02440
sky130_osu_sc_12T_ms__buf_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00271	0.17852
sky130_osu_sc_12T_ms__buf_2	0.00271	0.37387
sky130_osu_sc_12T_ms__buf_4	0.00271	0.74296
sky130_osu_sc_12T_ms__buf_6	0.00082	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00271	1.45262
sky130_osu_sc_12T_ms__buf_l	0.00201	0.15958

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00007	0.00007
sky130_osu_sc_12T_ms__buf_2	0.00000	0.00011	0.00011
sky130_osu_sc_12T_ms__buf_4	0.00000	0.00018	0.00019
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.00032	0.00034
sky130_osu_sc_12T_ms__buf_l	0.00000	0.00007	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (RR)**	0.24318	1.62783	10.82890
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.23400	1.43729	11.29180
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.30417	1.36282	11.75870
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.45625	1.40927	12.30280
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.23825	1.62681	10.62500

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (FF)**	0.36137	1.17208	8.27833
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.46191	1.25240	8.73610
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.69826	1.49415	9.33341
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	1.16604	2.00333	10.09390
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.32949	1.20909	8.34198

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00154	0.00142	0.00131
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00281	0.00278	0.00267
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00581	0.00591	0.00588
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01177	0.01217	0.01232
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00120	0.00112	0.00103

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00380	0.00369	0.00362
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00471	0.00475	0.00466
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00714	0.00743	0.00738
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01201	0.01272	0.01288
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00280	0.00275

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00032	-0.00033	-0.00032

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	0.00032	0.00033	0.00032

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffnr_1	0.00242	0.00247	0.00810	0.18295	0.18588
sky130_osu_sc_12T_ms__dffnr_l	0.00242	0.00247	0.00810	0.15874	0.16240

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.00039	0.00044
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.00039	0.00043

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FR)	2.36480	4.45606	19.55010
	QN->Q (FR)	0.15488	1.65323	13.97470
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	2.28839	4.52306	20.04460
	QN->Q (FR)	0.14438	1.59535	13.23140

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FF)	1.55574	4.07695	22.81370
	QN->Q (RF)	0.05699	0.82634	8.20714
	RN->Q (FF)	1.24090	3.83480	22.86180
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	1.52076	4.25960	23.55270
	QN->Q (RF)	0.06724	0.92299	8.73950
	RN->Q (FF)	1.20576	4.01509	23.59430

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->QN (FR)	1.33518	2.73153	14.21890
	RN->QN (FR)	1.01776	2.48865	14.26940
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	1.28454	2.69379	13.93620
	RN->QN (FR)	0.96630	2.44835	13.98170

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	**CK->QN (FF)**	2.07889	3.01571	10.52930
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	2.02089	3.03632	11.02460

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.26714	-0.71320	-7.94017
	setup	CK (F)	0.88223	0.93575	8.08534
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.26595	-0.71431	-7.94355
	setup	CK (F)	0.88557	0.93659	8.08696

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.65248	-0.61865	-2.13699
	setup	CK (F)	1.13717	1.12820	2.44500
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.65471	-0.62098	-2.13465
	setup	CK (F)	1.13966	1.13291	2.44470

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.26714	-0.71320	-7.94017
	setup	CK (F)	0.88223	0.93575	8.08534
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.26595	-0.71431	-7.94355
	setup	CK (F)	0.88557	0.93659	8.08696

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.65248	-0.61865	-2.13699
	setup	CK (F)	1.13717	1.12820	2.44500
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.65471	-0.62098	-2.13465
	setup	CK (F)	1.13966	1.13291	2.44470

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	recovery	CK (F)	0.76338	0.79855	-0.14001
	removal	CK (F)	-0.30506	-0.20138	0.45178
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.77045	0.79981	-0.13829
	removal	CK (F)	-0.30506	-0.20138	0.45108

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	recovery	CK (F)	0.76338	0.79855	-0.14001
	removal	CK (F)	-0.30506	-0.20138	0.45178
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.77045	0.79981	-0.13829
	removal	CK (F)	-0.30506	-0.20138	0.45108

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	min_pulse_width	RN ()	0.82854	1.16336	13.33370
	min_pulse_width	RN ()	0.82338	1.16550	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.81289	1.15049	13.33370
	min_pulse_width	RN ()	0.79242	1.15263	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_12T_ms__dffnr_1	min_pulse_width	CK ()	0.90523	0.94461	13.33370
	min_pulse_width	CK ()	1.21248	1.18266	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.91087	0.94675	13.33370
	min_pulse_width	CK ()	1.21301	1.18695	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_12T_ms__dffnr_1	min_pulse_width	CK ()	0.88250	1.14405	13.33370
	min_pulse_width	CK ()	0.89350	1.31991	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.86401	1.13976	13.33370
	min_pulse_width	CK ()	0.88166	1.31348	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.00711	0.00710	0.00655
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00671	0.00670	0.00630

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.00708	0.00697	0.00670
	RN	-0.00055	-0.01051	-0.07494
	RN	0.00895	0.00892	0.00859
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00667	0.00656	0.00632
	RN	-0.00055	-0.00965	-0.06502
	RN	0.00854	0.00850	0.00821

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.00708	0.00697	0.00668
	RN	-0.00055	-0.01061	-0.07614
	RN	0.00895	0.00892	0.00859
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00667	0.00656	0.00631
	RN	-0.00055	-0.00978	-0.06652
	RN	0.00854	0.00850	0.00822

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.00710	0.00709	0.00640
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00670	0.00669	0.00621

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00422	0.00413	0.00400
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00130	0.00123	0.00112
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00109	-0.00111	-0.00110
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00422	0.00413	0.00400
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00130	0.00123	0.00112
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00109	-0.00111	-0.00110

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00643	0.00637	0.00624
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00340	0.00333	0.00329
	!CK	0.00000	0.00000	0.00000
	!CK	0.00110	0.00111	0.00110
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00643	0.00637	0.00624
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00340	0.00333	0.00329
	!CK	0.00000	0.00000	0.00000
	!CK	0.00110	0.00111	0.00110

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00462	0.00447	0.00428
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00150	0.00141	0.00131
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00462	0.00447	0.00428
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00150	0.00141	0.00131

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00690	0.00677	0.00660
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00367	0.00356	0.00350
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00690	0.00677	0.00660
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00367	0.00356	0.00350

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00017	-0.00029	-0.00043
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00492	0.00461	0.00424
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00153	0.00130	0.00104
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00541	0.00516	0.00488
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00010	-0.00024	-0.00039
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00017	-0.00029	-0.00043
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00492	0.00461	0.00424
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00153	0.00130	0.00104
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00541	0.00516	0.00488
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00010	-0.00024	-0.00039

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00614	0.00595	0.00584
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00759	0.00728	0.00714
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00625	0.00605	0.00596
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00614	0.00595	0.00584
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00759	0.00728	0.00714
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00625	0.00605	0.00596

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00242	0.00247	0.00824	0.18151	0.18560
sky130_osu_sc_12T_ms__dffr_l	0.00242	0.00247	0.00824	0.15989	0.16246

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.00039	0.00044
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.00039	0.00044

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RR)	1.87567	3.86302	16.44220
	QN->Q (FR)	0.15488	1.64851	13.91610
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	1.79955	3.94573	17.13530
	QN->Q (FR)	0.14436	1.61670	13.28030

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RF)	1.84097	4.34720	21.07470
	QN->Q (RF)	0.05698	0.82511	8.19084
	RN->Q (FF)	1.24339	3.82883	22.74730
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	1.80625	4.54956	22.05640
	QN->Q (RF)	0.06723	0.92464	8.75714
	RN->Q (FF)	1.20692	4.03039	23.71370

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->QN (RR)	1.62041	3.01095	12.58050
	RN->QN (FR)	1.01967	2.49176	14.26340
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	1.56964	2.97397	12.31540
	RN->QN (FR)	0.96795	2.45235	13.98850

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	**CK->QN (RF)**	1.58923	2.42945	7.48894
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	1.53159	2.44875	7.98012

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.19833	-0.20928	-1.16954
	setup	CK (R)	1.39226	1.38156	1.97706
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.19881	-0.20892	-1.16971
	setup	CK (R)	1.39713	1.38929	1.98511

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.87526	-1.33544	-12.93270
	setup	CK (R)	1.00300	1.44655	13.09490
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.87776	-1.33577	-12.93330
	setup	CK (R)	1.00315	1.44655	13.09510

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.19833	-0.20928	-1.16954
	setup	CK (R)	1.39226	1.38156	1.97706
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.19881	-0.20892	-1.16971
	setup	CK (R)	1.39713	1.38929	1.98511

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.87526	-1.33544	-12.93270
	setup	CK (R)	1.00300	1.44655	13.09490
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.87776	-1.33577	-12.93330
	setup	CK (R)	1.00315	1.44655	13.09510

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	1.28562	1.28367	1.65831
	removal	CK (R)	-0.11691	-0.15361	-0.02080
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	1.29550	1.29331	1.66795
	removal	CK (R)	-0.11691	-0.15361	-0.02080

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	1.28562	1.28367	1.65831
	removal	CK (R)	-0.11691	-0.15361	-0.02080
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	1.29550	1.29331	1.66795
	removal	CK (R)	-0.11691	-0.15361	-0.02080

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	min_pulse_width	RN ()	0.82561	1.16550	13.33370
	min_pulse_width	RN ()	0.83671	1.16550	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.79462	1.15263	13.33370
	min_pulse_width	RN ()	0.81946	1.15049	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_12T_ms__dffr_1	min_pulse_width	CK ()	0.73418	0.88885	13.33370
	min_pulse_width	CK ()	1.08238	0.96820	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.66836	0.83952	13.33370
	min_pulse_width	CK ()	1.06384	0.95319	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_12T_ms__dffr_1	min_pulse_width	CK ()	1.89398	1.91610	13.33370
	min_pulse_width	CK ()	0.85073	1.23842	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	1.89927	1.92897	13.33370
	min_pulse_width	CK ()	0.85309	1.23842	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00377	0.00364	0.00301
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00337	0.00324	0.00279

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00416	0.00408	0.00382
	RN	-0.00055	-0.01046	-0.07435
	RN	0.00926	0.00923	0.00890
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00375	0.00366	0.00345
	RN	-0.00055	-0.00969	-0.06549
	RN	0.00885	0.00881	0.00851

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00416	0.00408	0.00381
	RN	-0.00055	-0.01060	-0.07602
	RN	0.00926	0.00923	0.00889
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00375	0.00366	0.00344
	RN	-0.00055	-0.00979	-0.06655
	RN	0.00885	0.00881	0.00852

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00376	0.00363	0.00288
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00336	0.00322	0.00270

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00095	-0.00098	-0.00097
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00422	0.00414	0.00401
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00159	0.00152	0.00141
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00095	-0.00098	-0.00097
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00422	0.00414	0.00401
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00159	0.00152	0.00141

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00097	0.00098	0.00097
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00643	0.00636	0.00624
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00311	0.00304	0.00301
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00097	0.00098	0.00097
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00643	0.00636	0.00624
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00311	0.00304	0.00301

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00150	0.00141	0.00131
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00437	0.00421	0.00402
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00150	0.00141	0.00131
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00437	0.00421	0.00402

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00367	0.00355	0.00350
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00715	0.00703	0.00685
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00367	0.00355	0.00350
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00715	0.00703	0.00685

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00027	-0.00038	-0.00053
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00209	0.00193	0.00162
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00023	-0.00038	-0.00053
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00027	-0.00038	-0.00053
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00209	0.00193	0.00162
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00023	-0.00038	-0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00605	0.00587	0.00577
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01129	0.01115	0.01071
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00856	0.00841	0.00823
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01135	0.01109	0.01083
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00620	0.00600	0.00594
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00605	0.00587	0.00577
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01129	0.01115	0.01071
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00856	0.00841	0.00823
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01135	0.01109	0.01083
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00620	0.00600	0.00594

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ms__dffsr_1	0.00238	0.00248	0.00581	0.00825	0.19064	0.18840
sky130_osu_sc_12T_ms__dffsr_l	0.00238	0.00248	0.00571	0.00825	0.15917	0.16068

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.00041	0.00047
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.00041	0.00047

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RR)	2.07334	4.09151	17.23520
	QN->Q (FR)	0.14961	1.64237	14.02520
	RN->Q (RR)	1.74853	3.79276	17.06410
	SN->Q (FR)	1.73264	3.84060	19.44260
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	2.01992	4.16156	17.46970
	QN->Q (FR)	0.14402	1.61447	13.24500
	RN->Q (RR)	1.69701	3.86429	17.31260
	SN->Q (FR)	1.68248	3.91006	19.67040

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RF)	2.06867	4.62977	21.89990
	QN->Q (RF)	0.05679	0.83252	8.29075
	RN->Q (FF)	1.33047	3.95348	23.45440
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	2.03246	4.77973	22.23500
	QN->Q (RF)	0.06693	0.92284	8.74325
	RN->Q (FF)	1.30017	4.11691	23.78530

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RR)	1.84525	3.24608	12.83130
	RN->QN (FR)	1.11027	2.57167	14.39840
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	1.79053	3.20501	12.49490
	RN->QN (FR)	1.06157	2.53820	14.06490

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RF)	1.79826	2.64177	7.90448
	RN->QN (RF)	1.46899	2.35064	7.74063
	SN->QN (FF)	1.45308	2.39803	10.11760
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	1.75690	2.67459	8.37706
	RN->QN (RF)	1.42780	2.38481	8.20206
	SN->QN (FF)	1.41244	2.43198	10.57440

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.25499	-0.25059	-1.32768
	setup	CK (R)	1.53861	1.51720	2.00792
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.25454	-0.25242	-1.32794
	setup	CK (R)	1.54200	1.52192	2.02318

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-1.01424	-1.45393	-13.18880
	setup	CK (R)	1.15755	1.54880	13.29110
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-1.01585	-1.45313	-13.18990
	setup	CK (R)	1.15863	1.54889	13.28930

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.25499	-0.25059	-1.32768
	setup	CK (R)	1.53861	1.51720	2.00792
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.25454	-0.25242	-1.32794
	setup	CK (R)	1.54200	1.52192	2.02318

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-1.01424	-1.45393	-13.18880
	setup	CK (R)	1.15755	1.54880	13.29110
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-1.01585	-1.45313	-13.18990
	setup	CK (R)	1.15863	1.54889	13.28930

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	1.35050	1.33778	1.63591
	removal	CK (R)	-0.13771	-0.16604	-0.14199
	hold	SN (R)	-1.43081	-1.74028	-11.57490
	setup	SN (R)	1.46728	1.80846	12.30830
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	1.35087	1.34082	1.64081
	removal	CK (R)	-0.13607	-0.16409	-0.15090
	hold	SN (R)	-1.34864	-1.66052	-11.47860
	setup	SN (R)	1.44923	1.75490	12.24310

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	1.35050	1.33778	1.63591
	removal	CK (R)	-0.13771	-0.16604	-0.14199
	hold	SN (R)	-1.44163	-1.74328	-11.57490
	hold	SN (R)	-1.43081	-1.74028	-11.58120
	setup	SN (R)	1.46728	1.80228	12.29290
	setup	SN (R)	1.46352	1.80846	12.30830
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	1.35087	1.34082	1.64081
	removal	CK (R)	-0.13607	-0.16409	-0.15090
	hold	SN (R)	-1.40423	-1.68953	-11.47860
	hold	SN (R)	-1.34864	-1.66052	-11.49530
	setup	SN (R)	1.44923	1.75490	12.21280
	setup	SN (R)	1.37684	1.75398	12.24310

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	RN ()	0.92478	1.23627	13.33370
	min_pulse_width	RN ()	0.92242	1.23627	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.89267	1.22126	13.33370
	min_pulse_width	RN ()	0.90898	1.22126	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.10804	0.11373	0.78012
	removal	CK (R)	-0.01971	-0.04162	-0.55653
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.11185	0.11467	0.78107
	removal	CK (R)	-0.01971	-0.04162	-0.55846

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.10804	0.11373	0.78012
	removal	CK (R)	-0.01971	-0.04162	-0.55653
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.11185	0.11467	0.78107
	removal	CK (R)	-0.01971	-0.04162	-0.55846

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	SN ()	1.41388	1.81531	14.12800
	min_pulse_width	SN ()	1.44529	1.81531	14.11820
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	1.39935	1.75311	13.99130
	min_pulse_width	SN ()	1.36388	1.75955	14.02050

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	CK ()	0.90358	1.00680	13.33370
	min_pulse_width	CK ()	1.15740	1.04540	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.84493	0.95748	13.33370
	min_pulse_width	CK ()	1.14102	1.03254	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_12T_ms__dffsr_1	min_pulse_width	CK ()	2.04817	2.06408	13.33370
	min_pulse_width	CK ()	1.01625	1.34564	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	2.05269	2.07265	13.33370
	min_pulse_width	CK ()	1.01883	1.34564	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00443	0.00435	0.00371
	RN	0.00835	0.00827	0.00768
	SN	-0.00055	-0.01077	-0.07809
	SN	0.00895	0.00888	0.00832
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00406	0.00397	0.00352
	RN	0.00798	0.00789	0.00749
	SN	-0.00055	-0.00967	-0.06520
	SN	0.00857	0.00849	0.00812

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00468	0.00463	0.00440
	RN	-0.00055	-0.01077	-0.07809
	RN	0.00983	0.00981	0.00950
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00428	0.00422	0.00400
	RN	-0.00055	-0.00967	-0.06520
	RN	0.00943	0.00940	0.00911

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00468	0.00463	0.00441
	RN	-0.00055	-0.01069	-0.07717
	RN	0.00983	0.00981	0.00951
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00429	0.00423	0.00400
	RN	-0.00055	-0.00972	-0.06582
	RN	0.00943	0.00940	0.00910

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00442	0.00433	0.00358
	RN	0.00834	0.00825	0.00755
	SN	-0.00055	-0.01069	-0.07716
	SN	0.00893	0.00886	0.00818
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00405	0.00395	0.00343
	RN	0.00796	0.00787	0.00739
	SN	-0.00055	-0.00972	-0.06581
	SN	0.00856	0.00848	0.00802

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00096	-0.00099	-0.00098
	(!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)	0.00517	0.00510	0.00498
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00173	0.00166	0.00156
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00172	0.00165	0.00155
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00174	0.00168	0.00157
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00096	-0.00099	-0.00098
	(!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)	0.00517	0.00510	0.00498
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00173	0.00166	0.00156
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00172	0.00165	0.00155
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00174	0.00168	0.00157

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00098	0.00099	0.00098
	(!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)	0.00728	0.00722	0.00703
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00349	0.00342	0.00338
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00350	0.00344	0.00340
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00347	0.00341	0.00337
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00098	0.00099	0.00098
	(!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)	0.00728	0.00722	0.00703
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00349	0.00342	0.00338
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00350	0.00344	0.00340
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00347	0.00341	0.00337

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_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)	0.00149	0.00140	0.00123
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00524	0.00508	0.00483
sky130_osu_sc_12T_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)	0.00149	0.00140	0.00123
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00524	0.00508	0.00483

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_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)	0.00409	0.00396	0.00393
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00766	0.00753	0.00734
sky130_osu_sc_12T_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)	0.00409	0.00396	0.00393
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00766	0.00753	0.00734

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_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)	-0.00260	-0.00263	-0.00262
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00282	-0.00286	-0.00284
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00262	-0.00264	-0.00263
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00088	0.00080	0.00063
sky130_osu_sc_12T_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)	-0.00260	-0.00263	-0.00262
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00282	-0.00286	-0.00284
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00262	-0.00264	-0.00263
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00088	0.00080	0.00063

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_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)	0.00261	0.00265	0.00263
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00283	0.00288	0.00284
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00262	0.00265	0.00263
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00594	0.00584	0.00580
sky130_osu_sc_12T_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)	0.00261	0.00265	0.00263
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00283	0.00288	0.00284
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00262	0.00265	0.00263
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00594	0.00584	0.00580

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00031	-0.00041	-0.00055
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00258	0.00243	0.00211
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00255	0.00240	0.00209
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00016	-0.00031	-0.00046
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00151	0.00129	0.00101
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00031	-0.00041	-0.00055
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00258	0.00243	0.00211
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00255	0.00240	0.00209
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00016	-0.00031	-0.00046
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00151	0.00129	0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_12T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01240	0.01226	0.01173
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00616	0.00598	0.00587
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00867	0.00855	0.00835
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00867	0.00857	0.00838
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01224	0.01197	0.01163
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00620	0.00601	0.00594
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00807	0.00776	0.00762
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01240	0.01226	0.01173
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00616	0.00598	0.00587
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00863	0.00855	0.00835
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00867	0.00857	0.00838
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01223	0.01197	0.01163
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00620	0.00601	0.00594
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00807	0.00776	0.00762

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00240	0.00492	0.00819	0.18449	0.18579
sky130_osu_sc_12T_ms__dffs_l	0.00240	0.00493	0.00819	0.15857	0.16090

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.00036	0.00041
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.00035	0.00040

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RR)	1.09471	3.02767	15.78500
	QN->Q (FR)	0.15516	1.65486	14.01360
	SN->Q (FR)	0.90725	2.90499	17.75640
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	1.06898	3.14562	16.28290
	QN->Q (FR)	0.14440	1.61004	13.20920
	SN->Q (FR)	0.88488	3.02660	18.21140

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RF)	2.01568	4.54459	21.48980
	QN->Q (RF)	0.05669	0.82608	8.21506
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	1.95650	4.68943	22.06520
	QN->Q (RF)	0.06700	0.92142	8.72922

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RR)	1.78777	3.18364	12.75720
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	1.71444	3.11808	12.39950

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RF)	0.86032	1.62489	6.71337
	SN->QN (FF)	0.66572	1.50927	8.68014
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.84423	1.68847	7.24839
	SN->QN (FF)	0.64780	1.56852	9.18123

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.15727	-0.17005	-1.07152
	setup	CK (R)	0.73679	0.72421	1.49689
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.16043	-0.17120	-1.07045
	setup	CK (R)	0.73930	0.73033	1.49811

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.91629	-1.36899	-13.02500
	setup	CK (R)	1.13605	1.49569	13.18810
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.91609	-1.36770	-13.02370
	setup	CK (R)	1.14067	1.49569	13.18880

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.15727	-0.17005	-1.07152
	setup	CK (R)	0.73679	0.72421	1.49689
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.16043	-0.17120	-1.07045
	setup	CK (R)	0.73930	0.73033	1.49811

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.91629	-1.36899	-13.02500
	setup	CK (R)	1.13605	1.49569	13.18810
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.91609	-1.36770	-13.02370
	setup	CK (R)	1.14067	1.49569	13.18880

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.17828	0.18516	1.17342
	removal	CK (R)	-0.05732	-0.08551	-0.84966
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.18149	0.18761	1.17516
	removal	CK (R)	-0.05732	-0.08551	-0.84966

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.17828	0.18516	1.17342
	removal	CK (R)	-0.05732	-0.08551	-0.84966
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.18149	0.18761	1.17516
	removal	CK (R)	-0.05732	-0.08551	-0.84966

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	min_pulse_width	SN ()	0.62894	1.19338	13.33370
	min_pulse_width	SN ()	0.64033	1.18480	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.61343	1.15478	13.33370
	min_pulse_width	SN ()	0.60350	1.16121	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_12T_ms__dffs_1	min_pulse_width	CK ()	0.32055	0.73444	13.33370
	min_pulse_width	CK ()	1.13476	1.02610	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.31417	0.73230	13.33370
	min_pulse_width	CK ()	1.10947	0.99608	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_12T_ms__dffs_1	min_pulse_width	CK ()	1.24211	1.26629	13.33370
	min_pulse_width	CK ()	0.99826	1.29203	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	1.24389	1.27058	13.33370
	min_pulse_width	CK ()	1.00320	1.29203	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00375	0.00363	0.00301
	SN	-0.00055	-0.01056	-0.07557
	SN	0.00782	0.00775	0.00714
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00335	0.00322	0.00267
	SN	-0.00055	-0.00964	-0.06495
	SN	0.00741	0.00734	0.00689

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00415	0.00408	0.00383
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00374	0.00367	0.00346

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00415	0.00408	0.00383
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00375	0.00367	0.00345

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00374	0.00361	0.00285
	SN	-0.00055	-0.01061	-0.07610
	SN	0.00779	0.00773	0.00698
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00334	0.00320	0.00266
	SN	-0.00055	-0.00973	-0.06590
	SN	0.00739	0.00733	0.00680

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00098	-0.00101	-0.00100
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00418	0.00409	0.00393
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00158	0.00151	0.00140
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00098	-0.00101	-0.00100
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00418	0.00409	0.00393
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00158	0.00151	0.00140

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00099	0.00101	0.00100
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00651	0.00644	0.00635
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00317	0.00311	0.00306
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00099	0.00101	0.00100
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00651	0.00644	0.00635
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00317	0.00311	0.00306

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00193	-0.00193	-0.00193
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00127	0.00118	0.00108
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00193	-0.00193	-0.00193
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00127	0.00118	0.00108

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00194	0.00195	0.00194
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00429	0.00416	0.00408
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00194	0.00195	0.00194
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00428	0.00416	0.00408

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00027	-0.00038	-0.00053
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00019	-0.00034	-0.00049
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00140	0.00118	0.00091
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00027	-0.00038	-0.00053
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00019	-0.00034	-0.00049
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00140	0.00118	0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01130	0.01115	0.01078
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00605	0.00587	0.00577
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01138	0.01108	0.01082
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00616	0.00597	0.00590
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00765	0.00734	0.00719
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01130	0.01115	0.01078
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00605	0.00587	0.00577
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01138	0.01108	0.01082
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00616	0.00597	0.00590
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00765	0.00734	0.00719

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00255	0.00817	0.18281
sky130_osu_sc_12T_ms__dff_l	0.00255	0.00817	0.15442

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.00034	0.00034
sky130_osu_sc_12T_ms__dff_l	0.00000	0.00033	0.00034

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	CK->Q (RR)	1.02279	2.41564	11.94790
sky130_osu_sc_12T_ms__dff_l	CK->Q (RR)	0.98868	2.36871	11.40740

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	CK->Q (RF)	1.71632	2.46587	7.73708
sky130_osu_sc_12T_ms__dff_l	CK->Q (RF)	1.67070	2.49974	8.18421

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	hold	CK (R)	-0.18267	-0.19298	-1.20101
	setup	CK (R)	0.66366	0.64880	1.54219
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.18410	-0.19262	-1.19923
	setup	CK (R)	0.66708	0.65166	1.54964

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	hold	CK (R)	-0.88692	-1.36369	-13.03270
	setup	CK (R)	1.04561	1.50929	13.26170
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.88487	-1.36357	-13.03120
	setup	CK (R)	1.04666	1.50962	13.26180

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	min_pulse_width	CK ()	0.33993	0.74731	13.33370
	min_pulse_width	CK ()	1.04594	0.95104	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.33150	0.74731	13.33370
	min_pulse_width	CK ()	1.03174	0.94461	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_12T_ms__dff_1	**min_pulse_width**	**CK** ()	1.16069	1.20196	13.33370
	min_pulse_width	**CK** ()	0.87730	1.29203	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK** ()	1.16253	1.20625	13.33370
	min_pulse_width	**CK** ()	0.87730	1.29203	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00794	0.00768	0.00727
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00711	0.00684	0.00644

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00854	0.00839	0.00809
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00773	0.00755	0.00727

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00094	-0.00098	-0.00097
	!CK	0.00000	0.00000	0.00000
	!CK	0.00391	0.00382	0.00365
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00094	-0.00098	-0.00097
	!CK	0.00000	0.00000	0.00000
	!CK	0.00391	0.00382	0.00365

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00096	0.00098	0.00097
	!CK	0.00000	0.00000	0.00000
	!CK	0.00685	0.00675	0.00663
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00096	0.00098	0.00097
	!CK	0.00000	0.00000	0.00000
	!CK	0.00685	0.00675	0.00663

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00029	-0.00040	-0.00055
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00019	-0.00034	-0.00049
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00029	-0.00040	-0.00055
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00019	-0.00034	-0.00049

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00604	0.00586	0.00576
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01099	0.01085	0.01048
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01162	0.01131	0.01103
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00612	0.00593	0.00586
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00604	0.00586	0.00576
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01099	0.01085	0.01048
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01162	0.01131	0.01103
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00612	0.00593	0.00586

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__inv_1	4.39560
sky130_osu_sc_12T_ms__inv_10	21.97800
sky130_osu_sc_12T_ms__inv_2	6.34920
sky130_osu_sc_12T_ms__inv_3	8.30280
sky130_osu_sc_12T_ms__inv_4	10.25640
sky130_osu_sc_12T_ms__inv_6	14.16360
sky130_osu_sc_12T_ms__inv_8	18.07080
sky130_osu_sc_12T_ms__inv_l	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00251	0.17867
sky130_osu_sc_12T_ms__inv_10	0.02210	1.83535
sky130_osu_sc_12T_ms__inv_2	0.00461	0.36812
sky130_osu_sc_12T_ms__inv_3	0.00682	0.54498
sky130_osu_sc_12T_ms__inv_4	0.00896	0.73336
sky130_osu_sc_12T_ms__inv_6	0.01341	1.09650
sky130_osu_sc_12T_ms__inv_8	0.01776	1.48292
sky130_osu_sc_12T_ms__inv_l	0.00198	0.15754

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00004	0.00004
sky130_osu_sc_12T_ms__inv_10	0.00000	0.00036	0.00038
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00007	0.00008
sky130_osu_sc_12T_ms__inv_3	0.00000	0.00011	0.00012
sky130_osu_sc_12T_ms__inv_4	0.00000	0.00014	0.00015
sky130_osu_sc_12T_ms__inv_6	0.00000	0.00021	0.00023
sky130_osu_sc_12T_ms__inv_8	0.00000	0.00028	0.00031
sky130_osu_sc_12T_ms__inv_l	0.00000	0.00003	0.00003

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (FR)**	0.15317	1.61363	13.60170
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.10817	1.03397	13.74500
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.10333	1.34228	13.64530
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.10392	1.25630	13.64710
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.09428	1.18309	13.64850
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.09510	1.10596	13.65050
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.10008	1.05587	13.76960
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.14668	1.59074	13.03530

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (RF)**	0.05277	0.79152	7.86109
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.05311	0.64377	8.00882
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.04067	0.72896	7.92161
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.04216	0.70417	7.96209
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.04034	0.68610	7.96614
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.04348	0.66533	7.98112
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.04777	0.65319	8.02358
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.06482	0.89588	8.50373

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00190	0.00185	0.00185
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.01561	0.01539	0.01566
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00325	0.00318	0.00321
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00502	0.00491	0.00496
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00636	0.00620	0.00634
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.00948	0.00932	0.00948
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01255	0.01238	0.01257
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00150	0.00146	0.00146

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00024	-0.00027	-0.00028
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00445	-0.00456	-0.00439
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00088	-0.00092	-0.00092
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00108	-0.00115	-0.00114
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00173	-0.00180	-0.00178
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00261	-0.00270	-0.00265
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00349	-0.00364	-0.00353
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00018	-0.00019	-0.00020

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_12T_ms__mux2_1	0.10813	0.10878	0.00519	0.17257

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00012	0.00012

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (RR)	-	0.08224	1.06823	10.01250
	A1->Y (RR)	-	0.09957	1.07443	10.02750
	S0->Y (RR)	(!A0 * A1)	0.18821	1.28608	9.89800
	S0->Y (FR)	(A0 * !A1)	0.15481	1.50238	11.38480

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (FF)	-	0.05825	0.76457	7.72078
	A1->Y (FF)	-	0.04521	0.75077	7.70366
	S0->Y (FF)	(!A0 * A1)	0.36806	1.14067	8.21744
	S0->Y (RF)	(A0 * !A1)	0.05601	0.79023	7.62646

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00183	-0.00184	-0.00184
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00123	-0.00123	-0.00124
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00273	0.00258	0.00252
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00109	-0.00122	-0.00134

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00183	0.00184	0.00184
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00123	0.00123	0.00124
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00038	0.00023	0.00014
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00497	0.00481	0.00476

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00050	-0.00050	-0.00050

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00050	0.00050	0.00050

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00060	-0.00060	-0.00060

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00060	0.00060	0.00060

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00036	-0.00050	-0.00060
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00036	-0.00050	-0.00060

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00390	0.00376	0.00370
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00379	0.00364	0.00359

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00249	0.00247	0.17956
sky130_osu_sc_12T_ms__nand2_l	0.00193	0.00194	0.15725

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00005	0.00008
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.00004	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (FR)	0.16145	1.61477	13.66230
	B->Y (FR)	0.18192	1.61746	13.45040
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.14859	1.58997	13.03840
	B->Y (FR)	0.16801	1.61254	13.05060

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (RF)	0.09715	1.05136	9.43041
	B->Y (RF)	0.10684	1.06562	9.35645
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.11554	1.24280	10.48530
	B->Y (RF)	0.12513	1.25664	10.44150

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00199	0.00195	0.00194
	B	0.00000	0.00000	0.00000
	B	0.00239	0.00235	0.00234
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00148	0.00146	0.00145
	B	0.00000	0.00000	0.00000
	B	0.00176	0.00173	0.00173

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_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	-0.00014	-0.00016
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00008	-0.00010	-0.00011
	B	0.00000	0.00000	0.00000
	B	-0.00008	-0.00010	-0.00010

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00117	-0.00117	-0.00118
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00083	-0.00082	-0.00083

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00118	0.00119	0.00118
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00083	0.00084	0.00083

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00108	-0.00108	-0.00108
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00077	-0.00077	-0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00108	0.00109	0.00108
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00077	0.00078	0.00077

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00243	0.00273	0.07769
sky130_osu_sc_12T_ms__nor2_l	0.00183	0.00206	0.06745

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00005	0.00007
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.00004	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (FR)	0.43301	2.31585	14.33670
	B->Y (FR)	0.39361	2.17763	13.86060
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.39645	2.29511	13.96490
	B->Y (FR)	0.36837	2.18099	13.20270

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (RF)	0.05968	0.70074	6.43500
	B->Y (RF)	0.05537	0.69211	6.41678
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.07108	0.76528	6.88770
	B->Y (RF)	0.06667	0.75350	6.87359

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00234	0.00229	0.00227
	B	0.00000	0.00000	0.00000
	B	0.00209	0.00195	0.00200
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00171	0.00167	0.00166
	B	0.00000	0.00000	0.00000
	B	0.00156	0.00151	0.00149

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00011	0.00006	0.00001
	B	0.00000	0.00000	0.00000
	B	-0.00021	-0.00022	-0.00026
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00011	0.00007	0.00004
	B	0.00000	0.00000	0.00000
	B	-0.00013	-0.00013	-0.00016

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00096	-0.00099	-0.00098
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !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_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00097	0.00099	0.00098
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00066	0.00066	0.00066

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00064	-0.00065	-0.00064
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00044	-0.00044	-0.00044

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00045	0.00045	0.00044

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00246	0.00253	0.00222	0.07629

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.00005	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (FR)	0.52227	2.33046	13.88280
	A1->Y (FR)	0.58272	2.46107	14.37860
	B0->Y (FR)	0.18781	1.28351	9.68670

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (RF)	0.12429	0.88727	7.17480
	A1->Y (RF)	0.13631	0.89174	7.17153
	B0->Y (RF)	0.10554	0.86805	7.29745

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00265	0.00258	0.00255
	A1	0.00000	0.00000	0.00000
	A1	0.00295	0.00290	0.00287
	B0	0.00206	0.00199	0.00196

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00017	0.00017	0.00014
	A1	0.00000	0.00000	0.00000
	A1	0.00053	0.00048	0.00044
	B0	0.00074	0.00072	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00065	-0.00065	-0.00065
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00098	-0.00100	-0.00100
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00103	-0.00103	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00065	0.00066	0.00065
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00099	0.00100	0.00100
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00103	0.00103	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00092	-0.00094	-0.00094
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00097	-0.00099	-0.00099
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00101	-0.00102	-0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00093	0.00094	0.00094
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00098	0.00100	0.00099
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00101	0.00102	0.00102

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00086	-0.00086	-0.00089

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00089	0.00090	0.00089

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00227	0.00242	0.00263	0.00257	0.07782

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (FR)	0.62676	2.50558	14.46380
	A1->Y (FR)	0.57549	2.38098	13.97680
	B0->Y (FR)	0.41244	2.19624	13.78750
	B1->Y (FR)	0.47335	2.33677	14.28310

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (RF)	0.16184	0.93896	7.28022
	A1->Y (RF)	0.14331	0.91726	7.24829
	B0->Y (RF)	0.12419	0.88922	7.37073
	B1->Y (RF)	0.14440	0.91680	7.41406

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00359	0.00353	0.00350
	A1	0.00327	0.00321	0.00318
	B0	0.00249	0.00243	0.00239
	B1	0.00283	0.00277	0.00273

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00065	0.00061	0.00055
	A1	0.00032	0.00033	0.00028
	B0	0.00032	0.00032	0.00026
	B1	0.00066	0.00061	0.00055

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00093	-0.00096	-0.00095
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00093	-0.00096	-0.00095
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00093	-0.00096	-0.00095
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00098	-0.00099	-0.00098

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00095	0.00096	0.00095
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00095	0.00096	0.00095
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00095	0.00096	0.00095
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00098	0.00100	0.00098

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00063	-0.00063	-0.00063
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00063	-0.00063	-0.00063
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00093	-0.00095	-0.00094
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00098	-0.00098	-0.00098

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00064	0.00064	0.00063
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00064	0.00064	0.00063
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00094	0.00095	0.00094
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00098	0.00099	0.00098

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00063	-0.00064	-0.00064
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00063	-0.00064	-0.00064
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00112	-0.00114	-0.00113
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00111	-0.00113	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00064	0.00065	0.00064
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00064	0.00065	0.00064
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00113	0.00114	0.00113
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00116	0.00117	0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00092	-0.00095	-0.00094
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00092	-0.00095	-0.00094
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00114	-0.00117	-0.00116
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00114	-0.00115	-0.00118

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00094	0.00095	0.00094
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00094	0.00095	0.00094
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00117	0.00117	0.00116
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00120	0.00119	0.00119

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__or2_1	8.30280
sky130_osu_sc_12T_ms__or2_2	10.25640
sky130_osu_sc_12T_ms__or2_4	14.16360
sky130_osu_sc_12T_ms__or2_8	21.97800
sky130_osu_sc_12T_ms__or2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00277	0.00257	0.17851
sky130_osu_sc_12T_ms__or2_2	0.00276	0.00257	0.36632
sky130_osu_sc_12T_ms__or2_4	0.00276	0.00257	0.72999
sky130_osu_sc_12T_ms__or2_8	0.00276	0.00257	1.41992
sky130_osu_sc_12T_ms__or2_l	0.00208	0.00195	0.15753

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00008	0.00010
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00011	0.00014
sky130_osu_sc_12T_ms__or2_4	0.00000	0.00018	0.00022
sky130_osu_sc_12T_ms__or2_8	0.00000	0.00032	0.00037
sky130_osu_sc_12T_ms__or2_l	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (RR)	0.25813	1.65377	10.98390
	B->Y (RR)	0.24625	1.63501	10.84920
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.25138	1.45274	11.28500
	B->Y (RR)	0.23874	1.43624	11.18970
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.32151	1.37677	11.73410
	B->Y (RR)	0.30868	1.36316	11.66290
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.47312	1.42242	12.23400
	B->Y (RR)	0.45973	1.40628	12.18880
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.25751	1.67478	10.88970
	B->Y (RR)	0.24415	1.65493	10.75720

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (FF)	0.87062	1.73753	9.21953
	B->Y (FF)	0.78407	1.59271	8.73345
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	1.11834	1.99855	9.71132
	B->Y (FF)	1.03140	1.85146	9.28317
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	1.66043	2.59088	10.53490
	B->Y (FF)	1.57302	2.42826	10.12690
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	2.73343	3.77485	11.96300
	B->Y (FF)	2.64554	3.62191	11.51580
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.78346	1.72079	9.42760
	B->Y (FF)	0.71304	1.57554	8.70696

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00191	0.00184	0.00171
	B	0.00000	0.00000	0.00000
	B	0.00156	0.00151	0.00138
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00321	0.00321	0.00309
	B	0.00000	0.00000	0.00000
	B	0.00285	0.00289	0.00277
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00622	0.00633	0.00627
	B	0.00000	0.00000	0.00000
	B	0.00586	0.00604	0.00597
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01220	0.01259	0.01277
	B	0.00000	0.00000	0.00000
	B	0.01183	0.01232	0.01252
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00149	0.00143	0.00134
	B	0.00000	0.00000	0.00000
	B	0.00123	0.00119	0.00110

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00425	0.00418	0.00414
	B	0.00000	0.00000	0.00000
	B	0.00378	0.00374	0.00369
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00518	0.00527	0.00525
	B	0.00000	0.00000	0.00000
	B	0.00471	0.00482	0.00478
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00756	0.00786	0.00794
	B	0.00000	0.00000	0.00000
	B	0.00708	0.00741	0.00748
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01233	0.01290	0.01342
	B	0.00000	0.00000	0.00000
	B	0.01186	0.01244	0.01291
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00316	0.00311	0.00308
	B	0.00000	0.00000	0.00000
	B	0.00283	0.00280	0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00097	-0.00100	-0.00099
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00097	-0.00100	-0.00099
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00097	-0.00100	-0.00099
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00097	-0.00100	-0.00099
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00065	-0.00067	-0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00098	0.00100	0.00099
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00098	0.00100	0.00099
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00098	0.00100	0.00099
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00098	0.00100	0.00099
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00066	0.00067	0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00065	-0.00065	-0.00065
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00065	-0.00064	-0.00065
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00065	-0.00064	-0.00065
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00065	-0.00066	-0.00065
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00043	-0.00043	-0.00043

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00045	0.00045	0.00043

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00270	0.00352	0.07985
sky130_osu_sc_12T_ms__tbufi_l	0.00207	0.00267	0.06737

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00006	0.00008
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.00006	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (FR)	0.36393	2.15550	13.92700
	OE->Y (FR)	0.22107	0.76966	6.02372
	OE->Y (RR)	0.43942	2.22501	11.45750
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.35035	2.16549	13.17960
	OE->Y (FR)	0.18560	0.71056	5.35231
	OE->Y (RR)	0.42659	2.24750	11.25650

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (RF)	0.09400	0.84837	7.29457
	OE->Y (FF)	0.22315	0.77046	6.02625
	OE->Y (RF)	0.09032	0.84832	7.19251
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.11326	0.95597	7.78983
	OE->Y (FF)	0.18646	0.71087	5.35305
	OE->Y (RF)	0.10646	0.95793	7.69540

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00192	0.00179	0.00181
	OE	0.00000	0.00000	0.00000
	OE	0.00166	0.00152	0.00143
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00144	0.00139	0.00136
	OE	0.00000	0.00000	0.00000
	OE	0.00124	0.00112	0.00106

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00021	-0.00022	-0.00026
	OE	0.00000	0.00000	0.00000
	OE	0.00122	0.00108	0.00099
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00013	-0.00013	-0.00016
	OE	0.00000	0.00000	0.00000
	OE	0.00086	0.00074	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00098	-0.00098	-0.00098
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00070	-0.00070	-0.00069
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00066	-0.00066	-0.00066

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00098	0.00098	0.00098
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00095	0.00095	0.00094
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00070	0.00070	0.00069
	(!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_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00051	0.00043
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00059	0.00044	0.00035
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00046	0.00035	0.00029
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00040	0.00029	0.00023

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00228	0.00212	0.00206
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00235	0.00220	0.00212
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00172	0.00161	0.00157
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00179	0.00167	0.00161

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00270	0.00391	0.07836
sky130_osu_sc_12T_ms__tnbufi_l	0.00197	0.00297	0.06733

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00006	0.00007
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.00006	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (FR)	0.36652	2.13821	13.79100
	OE->Y (RR)	0.06047	0.48577	3.77710
	OE->Y (FR)	0.37327	2.25109	14.24100
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.34318	2.15544	13.16580
	OE->Y (RR)	0.07178	0.51198	3.77770
	OE->Y (FR)	0.35297	2.25462	13.91740

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (RF)	0.09092	0.84233	7.25526
	OE->Y (RF)	0.06007	0.48233	3.77709
	OE->Y (FF)	0.28517	1.12767	7.70002
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.10616	0.95109	7.78413
	OE->Y (RF)	0.07088	0.50877	3.77772
	OE->Y (FF)	0.28581	1.19539	7.60379

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00199	0.00186	0.00189
	OE	0.00000	0.00000	0.00000
	OE	0.00446	0.00433	0.00430
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00148	0.00143	0.00140
	OE	0.00000	0.00000	0.00000
	OE	0.00342	0.00331	0.00329

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00031	-0.00031	-0.00035
	OE	0.00000	0.00000	0.00000
	OE	0.00407	0.00395	0.00391
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00023	-0.00023	-0.00026
	OE	0.00000	0.00000	0.00000
	OE	0.00309	0.00299	0.00296

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00082	-0.00082	-0.00082
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00078	-0.00077	-0.00077
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00055	-0.00055	-0.00055
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00052	-0.00052	-0.00051

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00082	0.00082	0.00082
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00078	0.00079	0.00078
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00055	0.00055	0.00055
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00053	0.00053	0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00113	-0.00130	-0.00139
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00108	-0.00126	-0.00137
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00077	-0.00089	-0.00096
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00074	-0.00088	-0.00096

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00346	0.00334	0.00330
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00340	0.00327	0.00323
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00266	0.00256	0.00252
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00262	0.00252	0.00249

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xnor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_l	0.00538	0.00447	0.07779

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.00015	0.00016

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (RR)	B	0.58225	2.34967	11.52520
	A->Y (FR)	!B	0.47974	2.28721	13.84560
	B->Y (RR)	A	0.51024	2.27514	11.39130
	B->Y (FR)	!A	0.51106	2.38124	14.29000

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (FF)	B	0.43331	1.27926	8.12234
	A->Y (RF)	!B	0.12943	0.87937	7.17265
	B->Y (FF)	A	0.41716	1.26079	8.09330
	B->Y (RF)	!A	0.13649	0.88715	7.19074

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00169	0.00154	0.00139
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00486	0.00465	0.00457
	B	A	0.00000	0.00000	0.00000
	B	A	0.00112	0.00100	0.00086
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00481	0.00465	0.00460

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00543	0.00530	0.00518
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00124	0.00111	0.00098
	B	A	0.00000	0.00000	0.00000
	B	A	0.00504	0.00497	0.00489
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00151	0.00134	0.00121

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00539	0.00452	0.07645

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.00015	0.00017

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (RR)	!B	0.62819	2.40370	11.55420
	A->Y (FR)	B	0.50767	2.36830	14.27220
	B->Y (RR)	!A	0.52621	2.30321	11.43880
	B->Y (FR)	A	0.54168	2.42257	14.33690

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (FF)	!B	0.45520	1.29014	8.13563
	A->Y (RF)	B	0.11673	0.87363	7.25111
	B->Y (FF)	!A	0.43122	1.27040	8.08146
	B->Y (RF)	A	0.12347	0.87727	7.15662

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00539	0.00517	0.00510
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00126	0.00105	0.00088
	B	A	0.00000	0.00000	0.00000
	B	A	0.00533	0.00516	0.00511
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00104	0.00092	0.00078

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00098	0.00079	0.00063
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00580	0.00567	0.00561
	B	A	0.00000	0.00000	0.00000
	B	A	0.00098	0.00081	0.00067
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00514	0.00507	0.00500

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28, Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.02420
sky130_osu_sc_12T_ms__tiehi	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__ant	0.00000	13107.50000	26215.00000
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_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_12T_ms__ant	0.00000	0.00000	0.00000
	-0.00119	0.00051	0.01827

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	0.22902	0.21332	0.03047