sky130_osu_sc_12T_ms_ff_1P95_-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_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.01073	0.01074	0.00829	1.81329	0.80432	1.55778
sky130_osu_sc_12T_ms__addf_l	0.01074	0.01074	0.00829	1.17830	0.80498	1.55342

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.11445	0.15009
sky130_osu_sc_12T_ms__addf_l	0.00000	0.54504	1.01123

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)	0.08461	1.18040	20.78050
	B->CO (RR)	0.08022	1.13042	19.89840
	CI->CO (RR)	0.07894	1.19999	21.23730
	CON->CO (FR)	0.01597	0.58334	10.58040
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.08440	1.07006	16.08950
	B->CO (RR)	0.08018	1.03689	15.71280
	CI->CO (RR)	0.07869	1.09147	16.61240
	CON->CO (FR)	0.01899	0.61320	9.98025

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)	0.12700	1.60045	27.93550
	B->CO (FF)	0.11031	1.51794	26.60310
	CI->CO (FF)	0.11087	1.60166	28.25740
	CON->CO (RF)	0.01343	0.42062	7.64676
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.12480	1.39595	20.82940
	B->CO (FF)	0.10862	1.32938	19.97520
	CI->CO (FF)	0.10868	1.39819	21.19270
	CON->CO (RF)	0.01469	0.42574	6.88018

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)	0.10985	0.76669	9.98404
	B->CON (FR)	0.09208	0.71801	9.56342
	CI->CON (FR)	0.09372	0.77080	10.39080
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.10443	0.76168	9.98435
	B->CON (FR)	0.08722	0.71353	9.56358
	CI->CON (FR)	0.08829	0.76597	10.39110

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)	0.05405	0.40077	5.13527
	B->CON (RF)	0.05073	0.39896	5.13987
	CI->CON (RF)	0.04838	0.42503	5.61138
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.05253	0.39919	5.13654
	B->CON (RF)	0.04930	0.39752	5.14114
	CI->CON (RF)	0.04684	0.42349	5.61259

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)	0.18689	1.44027	21.82580
	B->S (-R)	0.18537	1.40295	20.90660
	CI->S (-R)	0.16962	1.43975	22.16180
	CON->S (RR)	0.05035	0.46026	6.21857
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.18049	1.43366	21.77000
	B->S (-R)	0.17925	1.39692	20.85380
	CI->S (-R)	0.16323	1.43359	22.10530
	CON->S (RR)	0.05037	0.45960	6.19928

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)	0.14201	1.00648	14.36260
	B->S (-F)	0.14560	0.97486	13.89380
	CI->S (-F)	0.13594	1.02411	14.84150
	CON->S (FF)	0.06169	0.48659	6.31434
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.13894	1.00289	14.32610
	B->S (-F)	0.14270	0.97184	13.86000
	CI->S (-F)	0.13283	1.02076	14.80660
	CON->S (FF)	0.06172	0.48613	6.30150

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	0.00289	0.00418	0.03492
	B	0.00337	0.00447	0.03157
	CI	0.00410	0.00551	0.03631
sky130_osu_sc_12T_ms__addf_l	A	0.00261	0.00370	0.02740
	B	0.00310	0.00419	0.02532
	CI	0.00383	0.00513	0.02987

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01012	0.01292	0.07917
	B	0.01044	0.01263	0.07046
	CI	0.00866	0.01164	0.07949
sky130_osu_sc_12T_ms__addf_l	A	0.00989	0.01176	0.05404
	B	0.01017	0.01166	0.04863
	CI	0.00842	0.01051	0.05492

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01011	0.01162	0.04361
	B	0.01040	0.01157	0.04002
	CI	0.00865	0.01041	0.04464
sky130_osu_sc_12T_ms__addf_l	A	0.00986	0.01126	0.04217
	B	0.01014	0.01124	0.03882
	CI	0.00840	0.01005	0.04326

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00287	0.00365	0.02116
	B	0.00336	0.00402	0.02074
	CI	0.00409	0.00508	0.02483
sky130_osu_sc_12T_ms__addf_l	A	0.00260	0.00344	0.02208
	B	0.00309	0.00384	0.02160
	CI	0.00382	0.00488	0.02595

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01012	0.01259	0.06980
	B	0.00201	0.00136	0.05656
	CI	0.00866	0.01133	0.07048
sky130_osu_sc_12T_ms__addf_l	A	0.00989	0.01219	0.06706
	B	0.00201	0.00136	0.05580
	CI	0.00841	0.01093	0.06781

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.02178	0.02253	0.06732
	B	0.01970	0.02079	0.07706
	CI	0.01647	0.01745	0.06003
sky130_osu_sc_12T_ms__addf_l	A	0.02179	0.02251	0.06733
	B	0.01973	0.02080	0.07709
	CI	0.01647	0.01746	0.05987

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00523	0.00556	1.71676	1.77996	1.80377
sky130_osu_sc_12T_ms__addh_l	0.00523	0.00556	1.17292	1.78026	1.21632

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.13970	0.15000
sky130_osu_sc_12T_ms__addh_l	0.00000	1.00001	1.01105

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)	0.05658	0.44215	5.97255
	B->CO (RR)	0.05896	0.44455	6.12789
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.05623	0.48393	5.86564
	B->CO (RR)	0.05863	0.48675	5.96926

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)	0.05149	0.46918	6.62599
	B->CO (FF)	0.05524	0.48106	6.66575
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.05124	0.47800	6.14240
	B->CO (FF)	0.05490	0.49007	6.19347

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)	0.08176	0.45528	5.96422
	B->CON (RR)	0.08401	0.45668	6.13228
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.07633	0.44566	5.96911
	B->CON (RR)	0.07854	0.44745	6.10879

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)	0.07207	0.48659	6.76802
	B->CON (FF)	0.07115	0.49345	6.78446
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.06739	0.47331	6.66250
	B->CON (FF)	0.06655	0.48029	6.68211

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)	0.09940	1.02969	16.66120
	B->S (FR)	0.09862	1.03946	16.74120
	CON->S (FR)	0.01741	0.59369	10.74660
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.09557	0.96441	13.55650
	B->S (FR)	0.09488	0.97256	13.61090
	CON->S (FR)	0.01974	0.62425	10.23550

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)	0.10010	0.89731	14.07510
	B->S (RF)	0.10234	0.89848	14.22970
	CON->S (RF)	0.01306	0.42106	7.65833
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.09644	0.80361	10.57550
	B->S (RF)	0.09870	0.80560	10.69550
	CON->S (RF)	0.01428	0.43325	7.07648

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	0.00517	0.00587	0.02884
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00525	0.03581
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00462	0.00524	0.03001
	B	0.00000	0.00000	0.00000
	B	0.00419	0.00463	0.03513

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	0.00708	0.00799	0.03905
	B	0.00000	0.00000	0.00000
	B	0.00753	0.00886	0.04122
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00654	0.00750	0.03905
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00828	0.04084

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	0.00517	0.00586	0.02869
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00524	0.03567
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00462	0.00526	0.03000
	B	0.00000	0.00000	0.00000
	B	0.00419	0.00465	0.03503

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	0.00708	0.00799	0.03870
	B	0.00000	0.00000	0.00000
	B	0.00753	0.00886	0.04131
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00653	0.00752	0.03960
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00833	0.04149

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	0.00709	0.00801	0.03929
	B	0.00000	0.00000	0.00000
	B	0.00753	0.00887	0.04142
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00654	0.00750	0.03917
	B	0.00000	0.00000	0.00000
	B	0.00698	0.00825	0.04083

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	0.00517	0.00587	0.02895
	B	0.00000	0.00000	0.00000
	B	0.00475	0.00524	0.03588
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00462	0.00525	0.02956
	B	0.00000	0.00000	0.00000
	B	0.00419	0.00464	0.03459

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)	2.52451	2.42922	0.81819
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	2.52460	2.42932	0.81829

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)	2.52426	2.42921	0.83882
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	2.52436	2.42930	0.83892

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00282	0.00293	1.73515
sky130_osu_sc_12T_ms__and2_2	0.00282	0.00293	3.41873
sky130_osu_sc_12T_ms__and2_4	0.00282	0.00293	6.53262
sky130_osu_sc_12T_ms__and2_6	0.00285	0.00293	9.62471
sky130_osu_sc_12T_ms__and2_8	0.00283	0.00294	12.52531
sky130_osu_sc_12T_ms__and2_l	0.00219	0.00226	1.18278

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.06245	0.09984
sky130_osu_sc_12T_ms__and2_2	0.00000	0.09987	0.10000
sky130_osu_sc_12T_ms__and2_4	0.00000	0.17471	0.19957
sky130_osu_sc_12T_ms__and2_6	0.00000	0.24956	0.29926
sky130_osu_sc_12T_ms__and2_8	0.00000	0.32440	0.39894
sky130_osu_sc_12T_ms__and2_l	0.00000	1.13893	1.82221

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)	0.04305	0.40352	6.03064
	B->Y (RR)	0.04643	0.40513	5.79780
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.04851	0.34642	6.02203
	B->Y (RR)	0.05186	0.34666	5.79589
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.06658	0.33762	6.07499
	B->Y (RR)	0.06995	0.33620	5.87219
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.08535	0.35432	6.16917
	B->Y (RR)	0.08862	0.35113	5.98226
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.10384	0.37789	6.26022
	B->Y (RR)	0.10718	0.37272	6.07517
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.04611	0.46190	6.19626
	B->Y (RR)	0.04943	0.45887	5.92714

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)	0.04163	0.42364	6.07606
	B->Y (FF)	0.04285	0.42869	6.07366
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.04704	0.39285	6.12367
	B->Y (FF)	0.04793	0.39600	6.12883
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.06526	0.40330	6.21982
	B->Y (FF)	0.06439	0.40189	6.22783
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.08522	0.42881	6.32517
	B->Y (FF)	0.08253	0.42464	6.33064
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.10406	0.45375	6.34965
	B->Y (FF)	0.09984	0.44695	6.35374
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.04220	0.42124	5.55612
	B->Y (FF)	0.04589	0.43220	5.59318

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	0.00326	0.00576	0.09525
	B	0.00000	0.00000	0.00000
	B	0.00330	0.00455	0.06093
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00637	0.00885	0.09879
	B	0.00000	0.00000	0.00000
	B	0.00641	0.00775	0.06366
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01376	0.01589	0.10471
	B	0.00000	0.00000	0.00000
	B	0.01382	0.01510	0.06864
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02234	0.02379	0.11111
	B	0.00000	0.00000	0.00000
	B	0.02240	0.02267	0.07909
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03190	0.03199	0.11924
	B	0.00000	0.00000	0.00000
	B	0.03190	0.03086	0.08722
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00261	0.00625	0.11296
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00497	0.08805

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	0.00885	0.01276	0.08516
	B	0.00000	0.00000	0.00000
	B	0.01009	0.01335	0.08200
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01150	0.01545	0.08811
	B	0.00000	0.00000	0.00000
	B	0.01276	0.01622	0.08539
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01900	0.02242	0.09457
	B	0.00000	0.00000	0.00000
	B	0.02000	0.02276	0.09186
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02784	0.02956	0.10158
	B	0.00000	0.00000	0.00000
	B	0.02851	0.02976	0.09865
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03862	0.03630	0.10831
	B	0.00000	0.00000	0.00000
	B	0.03884	0.03667	0.10499
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00683	0.01175	0.10576
	B	0.00000	0.00000	0.00000
	B	0.00776	0.01242	0.10256

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)	-0.00302	-0.00304	-0.00305
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00301	-0.00304	-0.00305
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00301	-0.00304	-0.00304
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00305	-0.00307	-0.00308
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00301	-0.00304	-0.00304
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00215	-0.00216	-0.00217

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)	0.00304	0.00308	0.00306
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00304	0.00308	0.00306
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00304	0.00308	0.00306
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00308	0.00311	0.00309
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00305	0.00308	0.00306
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00218	0.00221	0.00219

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)	-0.00284	-0.00287	-0.00285
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00285	-0.00287	-0.00285
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00284	-0.00285	-0.00285
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00284	-0.00284	-0.00285
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00284	-0.00285	-0.00285
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00203	-0.00204	-0.00203

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)	0.00290	0.00289	0.00286
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00290	0.00287	0.00286
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00290	0.00288	0.00286
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00290	0.00289	0.00286
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00290	0.00287	0.00286
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00209	0.00208	0.00205

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00258	0.00276	0.00272	0.74498

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.02394	0.04984

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)	0.05605	0.72034	9.78801
	A1->Y (FR)	0.04269	0.64821	9.06487
	B0->Y (FR)	0.04290	0.73586	10.36290

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)	0.02684	0.35685	4.73918
	A1->Y (RF)	0.02397	0.36017	4.83794
	B0->Y (RF)	0.01715	0.35732	4.95488

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	0.00755	0.00769	0.02199
	A1	0.00000	0.00000	0.00000
	A1	0.00621	0.00636	0.02043
	B0	0.00456	0.00562	0.03006

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	0.00144	0.00150	0.01125
	A1	0.00000	0.00000	0.00000
	A1	0.00150	0.00177	0.01416
	B0	-0.00065	-0.00006	0.01278

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)	-0.00208	-0.00242	-0.00243
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00245	-0.00247	-0.00246
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00245	-0.00247	-0.00246

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)	0.00242	0.00247	0.00243
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00245	0.00247	0.00247
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00251	0.00249	0.00247

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)	-0.00207	-0.00245	-0.00244
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00246	-0.00248	-0.00246
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00275	-0.00274	-0.00277

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)	0.00242	0.00245	0.00244
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00246	0.00248	0.00247
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00276	0.00280	0.00278

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)	-0.00111	-0.00112	-0.00111

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)	0.00120	0.00120	0.00113

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_l	0.00258	0.00275	0.00288	0.00269	0.72631

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.02706	0.09969

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)	0.07247	0.73521	9.70587
	A1->Y (FR)	0.06372	0.72179	9.64200
	B0->Y (FR)	0.04514	0.73189	10.22710
	B1->Y (FR)	0.05424	0.74710	10.31280

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)	0.03427	0.36322	4.66308
	A1->Y (RF)	0.03136	0.36664	4.75878
	B0->Y (RF)	0.01820	0.34732	4.73942
	B1->Y (RF)	0.02159	0.34462	4.64524

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	0.00911	0.00919	0.02423
	A1	0.00778	0.00783	0.02262
	B0	0.00494	0.00601	0.03109
	B1	0.00633	0.00728	0.03195

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00296	0.00300	0.01335
	A1	0.00301	0.00324	0.01612
	B0	-0.00043	0.00011	0.01264
	B1	-0.00036	-0.00008	0.00991

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)	-0.00213	-0.00244	-0.00243
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00245	-0.00246	-0.00246
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00246	-0.00248	-0.00246
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00246	-0.00246	-0.00246

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)	0.00242	0.00244	0.00243
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00245	0.00248	0.00247
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00251	0.00248	0.00247
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00251	0.00248	0.00247

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)	-0.00212	-0.00243	-0.00244
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00246	-0.00248	-0.00247
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00274	-0.00276	-0.00276
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00274	-0.00276	-0.00276

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)	0.00243	0.00245	0.00244
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00246	0.00249	0.00247
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00275	0.00280	0.00277
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00275	0.00279	0.00277

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)	-0.00110	-0.00112	-0.00111
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00110	-0.00111	-0.00111
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00288	-0.00290	-0.00290
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00288	-0.00290	-0.00290

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)	0.00123	0.00123	0.00114
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00110	0.00111	0.00111
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00289	0.00295	0.00290
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00289	0.00295	0.00290

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)	-0.00113	-0.00114	-0.00113
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00112	-0.00113	-0.00112
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00260	-0.00262	-0.00261
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00260	-0.00262	-0.00261

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)	0.00124	0.00125	0.00116
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00112	0.00113	0.00112
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00266	0.00263	0.00261
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00266	0.00263	0.00261

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00294	1.58965
sky130_osu_sc_12T_ms__buf_2	0.00294	3.28664
sky130_osu_sc_12T_ms__buf_4	0.00293	6.50570
sky130_osu_sc_12T_ms__buf_6	0.00082	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00294	12.66410
sky130_osu_sc_12T_ms__buf_l	0.00223	1.19542

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.05000	0.05000
sky130_osu_sc_12T_ms__buf_2	0.00000	0.07500	0.09984
sky130_osu_sc_12T_ms__buf_4	0.00000	0.12500	0.19953
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.22500	0.39891
sky130_osu_sc_12T_ms__buf_l	0.00000	0.91117	0.91118

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)**	0.03654	0.39420	5.60708
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.03921	0.32465	5.58944
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.05292	0.30874	5.73437
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.08072	0.33651	5.93087
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.03802	0.43931	5.89002

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)**	0.03860	0.40440	5.69884
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.04421	0.38395	6.00295
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.06203	0.39778	6.24917
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.09988	0.44954	6.45128
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.04062	0.42148	5.69400

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	0.00308	0.00521	0.05612
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00610	0.00815	0.06045
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01319	0.01583	0.06763
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02943	0.03100	0.08921
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00246	0.00577	0.09785

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	0.00841	0.01183	0.07999
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01104	0.01439	0.08300
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01834	0.02096	0.08908
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03759	0.03484	0.10170
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00666	0.01171	0.10846

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
	-0.00078	-0.00079	-0.00075

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
	0.00078	0.00079	0.00075

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00270	0.00268	0.00860	1.71378	1.70385
sky130_osu_sc_12T_ms__dffnr_l	0.00270	0.00268	0.00860	1.19776	1.18911

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.60829	1.32703
sky130_osu_sc_12T_ms__dffnr_l	0.00000	1.46946	2.18821

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)	0.21529	1.10425	15.19710
	QN->Q (FR)	0.01914	0.66486	11.91040
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.21324	1.16154	14.40160
	QN->Q (FR)	0.02083	0.67124	10.98500

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)	0.14172	1.02206	15.42740
	QN->Q (RF)	0.01482	0.46861	8.38104
	RN->Q (FF)	0.13742	1.03221	15.45600
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.14370	1.11453	15.10440
	QN->Q (RF)	0.01566	0.47265	7.72805
	RN->Q (FF)	0.13938	1.12423	15.13170

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)	0.12453	0.60867	7.99141
	RN->QN (FR)	0.12021	0.61852	8.01789
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.12429	0.65999	7.99262
	RN->QN (FR)	0.11997	0.66895	8.01611

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)**	0.18828	0.60114	6.18280
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.18478	0.61046	5.84145

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)	-0.06072	-0.09721	0.64862
	setup	CK (F)	0.10166	0.10930	-0.56467
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06100	-0.09721	0.64862
	setup	CK (F)	0.10177	0.10930	-0.56467

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)	-0.04377	-0.05685	-0.24938
	setup	CK (F)	0.10765	0.13613	0.28586
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.04594	-0.05820	-0.24863
	setup	CK (F)	0.10807	0.13589	0.28270

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)	-0.06072	-0.09721	0.64862
	setup	CK (F)	0.10166	0.10930	-0.56467
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06100	-0.09721	0.64862
	setup	CK (F)	0.10177	0.10930	-0.56467

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)	-0.04377	-0.05685	-0.24938
	setup	CK (F)	0.10765	0.13613	0.28586
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.04594	-0.05820	-0.24863
	setup	CK (F)	0.10807	0.13589	0.28270

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)	0.09074	0.04338	-2.13440
	removal	CK (F)	-0.06210	-0.02911	2.16246
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.09095	0.04344	-2.13727
	removal	CK (F)	-0.06210	-0.02911	2.16246

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)	0.09074	0.04338	-2.13440
	removal	CK (F)	-0.06210	-0.02911	2.16246
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.09095	0.04344	-2.13727
	removal	CK (F)	-0.06210	-0.02911	2.16246

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 ()	0.08695	0.37109	13.33370
	min_pulse_width	RN ()	0.08413	0.37109	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.08413	0.37109	13.33370
	min_pulse_width	RN ()	0.08413	0.37109	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 ()	0.10101	0.37109	13.33370
	min_pulse_width	CK ()	0.13196	0.37109	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.10101	0.37109	13.33370
	min_pulse_width	CK ()	0.13196	0.37109	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 ()	0.08976	0.37109	13.33370
	min_pulse_width	CK ()	0.07288	0.37109	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.08695	0.37109	13.33370
	min_pulse_width	CK ()	0.07007	0.37109	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	0.01679	0.01590	0.01917
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01597	0.01619	0.04283

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	0.01651	0.01777	0.05511
	RN	-0.00110	-0.08796	-1.62916
	RN	0.02193	0.02140	0.03433
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01571	0.01796	0.07721
	RN	-0.00110	-0.07095	-1.13862
	RN	0.02112	0.02159	0.05623

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	0.01650	0.01777	0.05534
	RN	-0.00110	-0.08765	-1.61972
	RN	0.02193	0.02140	0.03440
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01570	0.01799	0.07734
	RN	-0.00110	-0.07064	-1.13040
	RN	0.02112	0.02158	0.05644

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	0.01675	0.01586	0.01975
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01593	0.01621	0.04566

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)	0.01100	0.01197	0.07332
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00338	0.00451	0.06407
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00234	-0.00273	-0.00273
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)	0.01101	0.01198	0.07332
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00339	0.00452	0.06408
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00233	-0.00272	-0.00273

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)	0.01687	0.01817	0.08077
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00931	0.01060	0.06992
	!CK	0.00000	0.00000	0.00000
	!CK	0.00273	0.00276	0.00274
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)	0.01688	0.01818	0.08078
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00932	0.01061	0.06992
	!CK	0.00000	0.00000	0.00000
	!CK	0.00273	0.00276	0.00275

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)	0.01114	0.01396	0.11821
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00338	0.00614	0.10345
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01115	0.01397	0.11821
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00339	0.00615	0.10346

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)	0.01697	0.02029	0.12407
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00907	0.01277	0.10977
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01698	0.02029	0.12408
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00908	0.01278	0.10977

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)	-0.00049	0.00168	0.10130
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01186	0.01618	0.15492
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00300	0.00761	0.18569
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01412	0.01581	0.16096
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00039	0.00178	0.10122
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00048	0.00169	0.10131
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01187	0.01619	0.15493
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00300	0.00762	0.18570
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01413	0.01582	0.16097
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00038	0.00179	0.10123

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)	0.01371	0.01729	0.11677
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01765	0.02414	0.20152
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01453	0.01790	0.11693
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01372	0.01730	0.11678
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01765	0.02416	0.20153
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01453	0.01791	0.11694

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00270	0.00268	0.00842	1.72843	1.71154
sky130_osu_sc_12T_ms__dffr_l	0.00270	0.00268	0.00841	1.18900	1.18523

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.60829	1.32712
sky130_osu_sc_12T_ms__dffr_l	0.00000	1.46946	2.18830

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)	0.17403	0.92759	12.82770
	QN->Q (FR)	0.01914	0.66705	11.97450
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.17181	0.97727	11.84580
	QN->Q (FR)	0.02083	0.66936	10.93340

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)	0.18207	0.94541	13.29250
	QN->Q (RF)	0.01482	0.47004	8.42447
	RN->Q (FF)	0.13758	1.03609	15.57470
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.18390	1.03127	12.76180
	QN->Q (RF)	0.01566	0.47133	7.69252
	RN->Q (FF)	0.13955	1.12081	15.03550

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)	0.16489	0.52946	5.76461
	RN->QN (FR)	0.12038	0.61985	8.04821
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.16451	0.57925	5.72419
	RN->QN (FR)	0.12011	0.66853	7.99624

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)**	0.14696	0.42237	3.71239
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.14333	0.43024	3.33459

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)	-0.03061	-0.04192	-0.00303
	setup	CK (R)	0.13556	0.16578	0.25111
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03078	-0.04192	-0.00059
	setup	CK (R)	0.13857	0.16731	0.25122

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)	-0.07275	-0.23073	-4.17450
	setup	CK (R)	0.09322	0.23993	4.22480
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07388	-0.23000	-4.17582
	setup	CK (R)	0.09322	0.23993	4.22480

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)	-0.03061	-0.04192	-0.00303
	setup	CK (R)	0.13556	0.16578	0.25111
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03078	-0.04192	-0.00059
	setup	CK (R)	0.13857	0.16731	0.25122

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)	-0.07275	-0.23073	-4.17450
	setup	CK (R)	0.09322	0.23993	4.22480
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07388	-0.23000	-4.17582
	setup	CK (R)	0.09322	0.23993	4.22480

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)	0.12073	0.15225	0.63478
	removal	CK (R)	-0.02563	-0.02911	-0.03620
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.12084	0.15268	0.63317
	removal	CK (R)	-0.02563	-0.02911	-0.03620

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)	0.12073	0.15225	0.63478
	removal	CK (R)	-0.02563	-0.02911	-0.03620
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.12084	0.15268	0.63317
	removal	CK (R)	-0.02563	-0.02911	-0.03620

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 ()	0.08413	0.37109	13.33370
	min_pulse_width	RN ()	0.08695	0.37109	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.08413	0.37109	13.33370
	min_pulse_width	RN ()	0.08413	0.37109	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 ()	0.07851	0.37109	13.33370
	min_pulse_width	CK ()	0.09539	0.37109	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.07288	0.37109	13.33370
	min_pulse_width	CK ()	0.09257	0.37109	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 ()	0.17697	0.37109	13.33370
	min_pulse_width	CK ()	0.07569	0.37109	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.17697	0.37109	13.33370
	min_pulse_width	CK ()	0.07569	0.37109	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	0.00895	0.00854	0.02917
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00813	0.00888	0.05549

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	0.01006	0.00884	0.02018
	RN	-0.00110	-0.08841	-1.64309
	RN	0.02298	0.02243	0.03493
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00925	0.00904	0.04262
	RN	-0.00110	-0.07063	-1.13029
	RN	0.02216	0.02263	0.05747

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	0.01005	0.00886	0.02032
	RN	-0.00110	-0.08789	-1.62703
	RN	0.02297	0.02243	0.03514
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00925	0.00905	0.04260
	RN	-0.00110	-0.07050	-1.12671
	RN	0.02216	0.02261	0.05738

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	0.00891	0.00854	0.02875
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00809	0.00886	0.05522

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	-0.00204	-0.00244	-0.00246
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01136	0.01233	0.07365
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00439	0.00550	0.06504
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00203	-0.00243	-0.00245
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01137	0.01233	0.07366
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00440	0.00551	0.06505

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	0.00244	0.00247	0.00246
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01653	0.01783	0.08043
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00831	0.00961	0.06893
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00245	0.00248	0.00247
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01653	0.01784	0.08044
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00832	0.00962	0.06894

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)	0.00338	0.00614	0.10346
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01056	0.01338	0.11763
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)	0.00339	0.00615	0.10346
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01057	0.01338	0.11764

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)	0.00906	0.01276	0.10976
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01755	0.02086	0.12465
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)	0.00907	0.01277	0.10977
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01756	0.02087	0.12466

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)	-0.00073	0.00167	0.10135
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00596	0.00750	0.11331
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00074	0.00161	0.10115
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00073	0.00168	0.10136
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00597	0.00751	0.11332
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00074	0.00162	0.10116

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)	0.01340	0.01737	0.11673
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02759	0.03076	0.15970
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02042	0.02361	0.12862
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02657	0.03373	0.19220
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01437	0.01819	0.11701
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01341	0.01736	0.11674
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02760	0.03077	0.15971
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02042	0.02362	0.12863
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02658	0.03367	0.19221
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01437	0.01820	0.11702

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00266	0.00270	0.00631	0.00855	1.83360	1.80958
sky130_osu_sc_12T_ms__dffsr_l	0.00266	0.00270	0.00631	0.00854	1.17884	1.18677

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.17611	0.24389
sky130_osu_sc_12T_ms__dffsr_l	0.00000	1.03728	1.10506

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)	0.18778	0.95761	13.39190
	QN->Q (FR)	0.01779	0.64059	11.66100
	RN->Q (RR)	0.15292	0.93637	13.55600
	SN->Q (FR)	0.14113	1.05343	15.95210
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.18838	0.99739	11.80770
	QN->Q (FR)	0.02078	0.66809	10.87210
	RN->Q (RR)	0.15329	0.97515	11.96620
	SN->Q (FR)	0.14198	1.09165	14.33610

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)	0.20605	0.98168	13.82790
	QN->Q (RF)	0.01469	0.47961	8.72976
	RN->Q (FF)	0.14459	1.05727	16.11020
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.20922	1.05454	12.66990
	QN->Q (RF)	0.01556	0.46913	7.64017
	RN->Q (FF)	0.14766	1.12926	14.94020

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)	0.18879	0.55196	5.85303
	RN->QN (FR)	0.12739	0.62762	8.13247
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.18988	0.60764	5.76558
	RN->QN (FR)	0.12833	0.68182	8.03244

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)	0.16191	0.45165	4.03113
	RN->QN (RF)	0.12790	0.43097	4.20088
	SN->QN (FF)	0.11560	0.54598	6.59496
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.16027	0.45382	3.39731
	RN->QN (RF)	0.12639	0.43373	3.56486
	SN->QN (FF)	0.11403	0.54668	5.95658

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)	-0.03533	-0.04944	-0.03331
	setup	CK (R)	0.14724	0.17503	0.30026
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.03583	-0.04944	-0.03350
	setup	CK (R)	0.14681	0.17482	0.30058

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)	-0.08507	-0.24434	-4.21093
	setup	CK (R)	0.10493	0.25307	4.25684
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.08359	-0.24263	-4.20980
	setup	CK (R)	0.10692	0.25307	4.25676

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)	-0.03533	-0.04944	-0.03331
	setup	CK (R)	0.14724	0.17503	0.30026
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.03583	-0.04944	-0.03350
	setup	CK (R)	0.14681	0.17482	0.30058

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)	-0.08507	-0.24434	-4.21093
	setup	CK (R)	0.10493	0.25307	4.25684
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.08359	-0.24263	-4.20980
	setup	CK (R)	0.10692	0.25307	4.25676

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)	0.12110	0.14665	0.65393
	removal	CK (R)	-0.01843	-0.02563	-0.03856
	hold	SN (R)	-0.11018	-0.20506	-0.97694
	setup	SN (R)	0.13009	0.23890	2.20733
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.11987	0.14663	0.65305
	removal	CK (R)	-0.01843	-0.02563	-0.03856
	hold	SN (R)	-0.10727	-0.20099	-0.96288
	setup	SN (R)	0.12921	0.23206	2.16248

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)	0.12110	0.14665	0.65393
	removal	CK (R)	-0.01843	-0.02563	-0.03856
	hold	SN (R)	-0.11018	-0.20506	-0.97694
	hold	SN (R)	-0.11245	-0.20775	-0.98412
	setup	SN (R)	0.12917	0.23890	2.03089
	setup	SN (R)	0.13009	0.23760	2.20733
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.11987	0.14663	0.65305
	removal	CK (R)	-0.01843	-0.02563	-0.03856
	hold	SN (R)	-0.10960	-0.20170	-0.97377
	hold	SN (R)	-0.10727	-0.20099	-0.96288
	setup	SN (R)	0.12921	0.23135	1.98077
	setup	SN (R)	0.12376	0.23206	2.16248

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 ()	0.09820	0.37109	13.33370
	min_pulse_width	RN ()	0.10101	0.37109	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.09820	0.37109	13.33370
	min_pulse_width	RN ()	0.09820	0.37109	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)	0.02484	0.04930	1.95303
	removal	CK (R)	-0.01005	-0.03944	-0.23598
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02457	0.04930	1.82502
	removal	CK (R)	-0.01005	-0.03944	-0.23598

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)	0.02484	0.04930	1.95303
	removal	CK (R)	-0.01005	-0.03944	-0.23598
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02457	0.04930	1.82502
	removal	CK (R)	-0.01005	-0.03944	-0.23598

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 ()	0.11508	0.37109	13.33370
	min_pulse_width	SN ()	0.11789	0.37109	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.11508	0.37109	13.33370
	min_pulse_width	SN ()	0.11227	0.37109	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__dffsr_1	min_pulse_width	CK ()	0.08132	0.37109	13.33370
	min_pulse_width	CK ()	0.10945	0.37109	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.07851	0.37109	13.33370
	min_pulse_width	CK ()	0.10664	0.37109	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 ()	0.18823	0.37109	13.33370
	min_pulse_width	CK ()	0.08976	0.37109	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.18823	0.37109	13.33370
	min_pulse_width	CK ()	0.08976	0.37109	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	0.01111	0.01036	0.02698
	RN	0.02000	0.01857	0.02145
	SN	-0.00110	-0.09160	-1.74307
	SN	0.01962	0.01741	0.01554
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01035	0.01090	0.05695
	RN	0.01923	0.01907	0.05156
	SN	-0.00110	-0.07027	-1.12063
	SN	0.01886	0.01794	0.04516

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	0.01162	0.01101	0.03177
	RN	-0.00110	-0.09160	-1.74307
	RN	0.02395	0.02403	0.04740
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01082	0.01065	0.04485
	RN	-0.00110	-0.07027	-1.12063
	RN	0.02314	0.02367	0.06047

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	0.01161	0.01103	0.03210
	RN	-0.00110	-0.09088	-1.72023
	RN	0.02395	0.02403	0.04791
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01081	0.01063	0.04442
	RN	-0.00110	-0.07055	-1.12818
	RN	0.02314	0.02366	0.06026

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	0.01108	0.01039	0.02694
	RN	0.01996	0.01856	0.02225
	SN	-0.00110	-0.09088	-1.72019
	SN	0.01959	0.01739	0.01609
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01031	0.01090	0.05596
	RN	0.01919	0.01903	0.05116
	SN	-0.00110	-0.07055	-1.12816
	SN	0.01882	0.01788	0.04488

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	-0.00242	-0.00248	-0.00248
	(!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)	0.01425	0.01516	0.07545
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00472	0.00577	0.06501
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00470	0.00575	0.06497
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00474	0.00580	0.06504
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00241	-0.00247	-0.00247
	(!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)	0.01425	0.01517	0.07546
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00473	0.00578	0.06502
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00470	0.00575	0.06498
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00475	0.00581	0.06505

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	0.00251	0.00248	0.00248
	(!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)	0.01903	0.02018	0.08081
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00905	0.01031	0.06938
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00911	0.01034	0.06937
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00902	0.01030	0.06935
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00252	0.00248	0.00248
	(!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)	0.01904	0.02019	0.08082
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00906	0.01032	0.06939
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00912	0.01035	0.06937
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00903	0.01031	0.06935

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)	0.00251	0.00512	0.10238
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01238	0.01476	0.11706
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)	0.00252	0.00513	0.10239
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01239	0.01477	0.11706

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)	0.00983	0.01364	0.11080
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01855	0.02187	0.12407
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)	0.00984	0.01364	0.11081
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01855	0.02187	0.12407

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)	-0.00643	-0.00644	-0.00646
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00621	-0.00701	-0.00696
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00607	-0.00646	-0.00644
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00292	0.00397	0.06515
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)	-0.00642	-0.00644	-0.00646
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00620	-0.00700	-0.00696
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00606	-0.00645	-0.00643
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00293	0.00398	0.06515

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)	0.00645	0.00655	0.00648
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00692	0.00701	0.00697
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00641	0.00649	0.00645
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01528	0.01592	0.07495
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)	0.00646	0.00656	0.00649
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00693	0.00701	0.00698
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00642	0.00650	0.00646
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01528	0.01593	0.07496

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)	-0.00081	0.00157	0.10125
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00696	0.00854	0.11412
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00687	0.00843	0.11406
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00058	0.00175	0.10129
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00292	0.00743	0.18547
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00080	0.00158	0.10126
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00697	0.00854	0.11413
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00688	0.00843	0.11407
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00058	0.00175	0.10130
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00293	0.00744	0.18548

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)	0.03085	0.03404	0.16218
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01367	0.01774	0.11697
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02070	0.02391	0.12870
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02073	0.02398	0.12914
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02919	0.03622	0.19430
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01438	0.01816	0.11700
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01833	0.02559	0.20229
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03086	0.03405	0.16219
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01368	0.01772	0.11698
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02071	0.02392	0.12871
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02074	0.02399	0.12915
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02920	0.03618	0.19431
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01439	0.01817	0.11701
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01834	0.02560	0.20230

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00268	0.00526	0.00845	1.73495	1.72495
sky130_osu_sc_12T_ms__dffs_l	0.00268	0.00526	0.00845	1.19123	1.18995

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	1.33184	3.74459
sky130_osu_sc_12T_ms__dffs_l	0.00000	2.19302	4.60577

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)	0.13500	0.87967	12.76590
	QN->Q (FR)	0.01910	0.66458	11.94260
	SN->Q (FR)	0.10939	0.99861	15.09590
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.13543	0.93311	11.76690
	QN->Q (FR)	0.02078	0.66863	10.90790
	SN->Q (FR)	0.10989	1.04833	14.07920

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)	0.19519	0.96166	13.32930
	QN->Q (RF)	0.01475	0.46865	8.41217
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.19595	1.04460	12.77640
	QN->Q (RF)	0.01561	0.47012	7.67788

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)	0.17788	0.54594	5.81042
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.17645	0.59337	5.75046

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)	0.11066	0.37626	3.65312
	SN->QN (FF)	0.08465	0.49372	5.98480
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.10932	0.38737	3.26026
	SN->QN (FF)	0.08338	0.50190	5.58062

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)	-0.02361	-0.03167	0.00978
	setup	CK (R)	0.10166	0.13838	0.24580
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02339	-0.03173	0.01360
	setup	CK (R)	0.10138	0.13822	0.24679

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)	-0.07476	-0.23413	-4.20445
	setup	CK (R)	0.09824	0.24321	4.25290
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07867	-0.23415	-4.20214
	setup	CK (R)	0.09823	0.24321	4.25290

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)	-0.02361	-0.03167	0.00978
	setup	CK (R)	0.10166	0.13838	0.24580
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02339	-0.03173	0.01360
	setup	CK (R)	0.10138	0.13822	0.24679

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)	-0.07476	-0.23413	-4.20445
	setup	CK (R)	0.09824	0.24321	4.25290
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07867	-0.23415	-4.20214
	setup	CK (R)	0.09823	0.24321	4.25290

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)	0.02464	0.04930	1.63337
	removal	CK (R)	-0.01434	-0.03944	-0.49046
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.02457	0.04930	1.50898
	removal	CK (R)	-0.01434	-0.03944	-0.49046

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)	0.02464	0.04930	1.63337
	removal	CK (R)	-0.01434	-0.03944	-0.49046
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.02457	0.04930	1.50898
	removal	CK (R)	-0.01434	-0.03944	-0.49046

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 ()	0.07569	0.37109	13.33370
	min_pulse_width	SN ()	0.08132	0.37109	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.07569	0.37109	13.33370
	min_pulse_width	SN ()	0.07569	0.37109	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 ()	0.05600	0.37109	13.33370
	min_pulse_width	CK ()	0.09820	0.37109	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.05319	0.37109	13.33370
	min_pulse_width	CK ()	0.09539	0.37109	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 ()	0.14040	0.37109	13.33370
	min_pulse_width	CK ()	0.08132	0.37109	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.14040	0.37109	13.33370
	min_pulse_width	CK ()	0.08132	0.37109	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	0.00886	0.00846	0.02977
	SN	-0.00110	-0.08861	-1.64929
	SN	0.01625	0.01749	0.06374
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00804	0.00881	0.05598
	SN	-0.00110	-0.07071	-1.13242
	SN	0.01544	0.01788	0.08952

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	0.01002	0.00889	0.02156
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00923	0.00908	0.04364

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	0.01002	0.00890	0.02148
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00922	0.00909	0.04345

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	0.00883	0.00847	0.02941
	SN	-0.00110	-0.08830	-1.63975
	SN	0.01623	0.01749	0.06283
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00881	0.05548
	SN	-0.00110	-0.07067	-1.13117
	SN	0.01540	0.01785	0.08915

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	-0.00243	-0.00248	-0.00249
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01115	0.01235	0.07640
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00435	0.00545	0.06499
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00242	-0.00248	-0.00248
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01116	0.01236	0.07640
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00436	0.00546	0.06500

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	0.00258	0.00254	0.00255
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01638	0.01758	0.08025
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00832	0.00964	0.06911
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00259	0.00255	0.00255
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01639	0.01758	0.08026
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00832	0.00967	0.06912

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)	-0.00479	-0.00481	-0.00481
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00301	0.00534	0.10784
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)	-0.00478	-0.00481	-0.00480
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00302	0.00533	0.10785

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)	0.00484	0.00485	0.00482
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01072	0.01446	0.11788
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)	0.00485	0.00486	0.00483
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01073	0.01447	0.11789

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)	-0.00073	0.00169	0.10146
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00063	0.00173	0.10138
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00263	0.00733	0.18603
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00073	0.00170	0.10146
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00062	0.00174	0.10139
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00264	0.00734	0.18604

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)	0.02755	0.03078	0.16084
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01341	0.01748	0.11685
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02626	0.03328	0.19240
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01431	0.01815	0.11706
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01731	0.02518	0.20215
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02756	0.03079	0.16085
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01342	0.01745	0.11686
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02627	0.03331	0.19241
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01432	0.01827	0.11706
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01731	0.02519	0.20216

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00283	0.00819	1.51709
sky130_osu_sc_12T_ms__dff_l	0.00283	0.00817	1.08245

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.16092	0.20014
sky130_osu_sc_12T_ms__dff_l	0.00000	1.02209	1.06131

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)**	0.11312	0.48371	5.46301
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.11330	0.52916	5.37184

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)**	0.16957	0.41923	3.40251
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.17014	0.43843	3.18607

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)	-0.02068	-0.03287	-0.00047
	setup	CK (R)	0.08063	0.12317	0.21652
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.02068	-0.03287	-0.00068
	setup	CK (R)	0.08061	0.12319	0.21773

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)	-0.06695	-0.23007	-4.19802
	setup	CK (R)	0.08283	0.23993	4.24042
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.06756	-0.23007	-4.19802
	setup	CK (R)	0.08283	0.23993	4.24042

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 ()	0.04756	0.37109	13.33370
	min_pulse_width	CK ()	0.08976	0.37109	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.04475	0.37109	13.33370
	min_pulse_width	CK ()	0.08695	0.37109	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 ()**	0.11789	0.37109	13.33370
	min_pulse_width	**CK ()**	0.06725	0.37109	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.11789	0.37109	13.33370
	min_pulse_width	**CK ()**	0.06725	0.37109	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	0.01848	0.02243	0.16318
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01678	0.02081	0.16113

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	0.02023	0.02198	0.12828
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01865	0.02045	0.12654

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	-0.00203	-0.00243	-0.00244
	!CK	0.00000	0.00000	0.00000
	!CK	0.00975	0.01090	0.07303
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00202	-0.00242	-0.00244
	!CK	0.00000	0.00000	0.00000
	!CK	0.00975	0.01091	0.07303

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	0.00243	0.00245	0.00244
	!CK	0.00000	0.00000	0.00000
	!CK	0.01683	0.01807	0.08085
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00243	0.00246	0.00245
	!CK	0.00000	0.00000	0.00000
	!CK	0.01683	0.01808	0.08086

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)	-0.00078	0.00167	0.10144
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00066	0.00172	0.10137
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00077	0.00168	0.10145
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00065	0.00173	0.10138

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)	0.01337	0.01776	0.11683
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02617	0.02952	0.15960
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02660	0.03445	0.19453
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01420	0.01811	0.11696
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01338	0.01777	0.11684
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02618	0.02953	0.15961
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02660	0.03446	0.19453
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01420	0.01812	0.11696

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00273	1.51439
sky130_osu_sc_12T_ms__inv_10	0.02425	14.98035
sky130_osu_sc_12T_ms__inv_2	0.00505	3.12625
sky130_osu_sc_12T_ms__inv_3	0.00746	4.59935
sky130_osu_sc_12T_ms__inv_4	0.00982	6.19736
sky130_osu_sc_12T_ms__inv_6	0.01470	9.20572
sky130_osu_sc_12T_ms__inv_8	0.01947	12.18189
sky130_osu_sc_12T_ms__inv_l	0.00219	1.02373

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.02500	0.04984
sky130_osu_sc_12T_ms__inv_10	0.00000	0.25000	0.49845
sky130_osu_sc_12T_ms__inv_2	0.00000	0.05000	0.09969
sky130_osu_sc_12T_ms__inv_3	0.00000	0.07500	0.14953
sky130_osu_sc_12T_ms__inv_4	0.00000	0.10000	0.19938
sky130_osu_sc_12T_ms__inv_6	0.00000	0.15000	0.29907
sky130_osu_sc_12T_ms__inv_8	0.00000	0.20000	0.39876
sky130_osu_sc_12T_ms__inv_l	0.00000	0.45559	0.91104

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)**	0.01817	0.59039	10.25920
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.02359	0.37894	10.18300
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01372	0.49756	10.15660
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.01502	0.46560	10.23380
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.01507	0.43734	10.17750
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.01720	0.40755	10.17490
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02013	0.38943	10.17640
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02085	0.60948	9.57884

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)**	0.01335	0.39076	6.74715
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.01853	0.22267	7.04819
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01075	0.32862	6.93878
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01180	0.30213	7.08288
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01174	0.27821	7.08503
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.01406	0.25128	7.11043
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.01624	0.23423	7.11268
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.01466	0.40215	6.22251

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	0.00421	0.00616	0.02703
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03499	0.05810	0.24670
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00720	0.01158	0.05149
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01110	0.01710	0.07627
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01411	0.02224	0.10096
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02093	0.03325	0.15093
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02779	0.04800	0.20104
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00338	0.00556	0.04117

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	-0.00077	-0.00020	0.00982
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01207	-0.00226	0.08961
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00250	-0.00108	0.01834
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00328	-0.00054	0.02733
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00506	-0.00162	0.03598
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00773	-0.00185	0.05384
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01021	-0.00076	0.07211
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00057	-0.00011	0.00948

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.47687	0.47710	0.00562	0.48639

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.05262	0.06003

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)	-	0.00709	0.14772	1.65032
	A1->Y (RR)	-	0.00815	0.14905	1.64720
	S0->Y (RR)	(!A0 * A1)	0.02766	0.17569	1.00229
	S0->Y (FR)	(A0 * !A1)	0.02046	0.29101	3.52211

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)	-	0.00843	0.17563	2.02492
	A1->Y (FF)	-	0.00788	0.17372	2.01697
	S0->Y (FF)	(!A0 * A1)	0.03670	0.27863	2.92329
	S0->Y (RF)	(A0 * !A1)	0.01514	0.18327	1.67700

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	-	-0.00426	-0.00426	-0.00426
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00260	-0.00261	-0.00260
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00572	0.01022	0.10818
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00267	0.00044	0.09836

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	-	0.00426	0.00426	0.00427
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00260	0.00261	0.00260
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00058	0.00398	0.10248
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01162	0.01577	0.11303

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)	-0.00096	-0.00096	-0.00096

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)	0.00096	0.00096	0.00096

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)	-0.00117	-0.00117	-0.00117

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)	0.00117	0.00117	0.00117

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)	-0.00107	0.00226	0.10028
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00103	0.00221	0.10035

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)	0.00897	0.01303	0.11050
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00837	0.01264	0.11043

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00271	0.00271	1.51784
sky130_osu_sc_12T_ms__nand2_l	0.00214	0.00217	1.01608

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.02503	0.09969
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.45561	1.82207

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)	0.01887	0.59337	10.31220
	B->Y (FR)	0.02178	0.56430	9.74328
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.02092	0.60906	9.53315
	B->Y (FR)	0.02582	0.61218	9.51695

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)	0.01759	0.46667	8.06017
	B->Y (RF)	0.02060	0.46516	7.94549
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.01947	0.48727	7.52757
	B->Y (RF)	0.02230	0.47814	7.27471

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	0.00448	0.00624	0.02435
	B	0.00000	0.00000	0.00000
	B	0.00589	0.00757	0.02687
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00342	0.00509	0.03569
	B	0.00000	0.00000	0.00000
	B	0.00447	0.00613	0.03773

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	-0.00052	-0.00011	0.00868
	B	0.00000	0.00000	0.00000
	B	-0.00052	-0.00029	0.00690
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00032	0.00002	0.00820
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00011	0.00681

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)	-0.00290	-0.00292	-0.00292
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00208	-0.00210	-0.00210

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)	0.00292	0.00294	0.00293
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00210	0.00212	0.00211

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)	-0.00265	-0.00265	-0.00266
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00193	-0.00194	-0.00194

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)	0.00271	0.00265	0.00267
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00197	0.00195	0.00194

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00267	0.00294	0.89417
sky130_osu_sc_12T_ms__nor2_l	0.00206	0.00227	0.62122

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.01866	0.04984
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.29503	0.91102

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)	0.03794	0.69194	10.17260
	B->Y (FR)	0.02945	0.69278	10.38370
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.04050	0.72188	9.56291
	B->Y (FR)	0.03378	0.71736	9.69777

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)	0.01779	0.32164	4.60717
	B->Y (RF)	0.01428	0.31481	4.59236
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.01825	0.33346	4.28780
	B->Y (RF)	0.01550	0.32792	4.27363

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	0.00602	0.00631	0.02053
	B	0.00000	0.00000	0.00000
	B	0.00465	0.00584	0.02978
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00444	0.00507	0.02615
	B	0.00000	0.00000	0.00000
	B	0.00357	0.00539	0.04248

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	0.00058	0.00098	0.01367
	B	0.00000	0.00000	0.00000
	B	-0.00059	0.00006	0.01207
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00041	0.00079	0.01338
	B	0.00000	0.00000	0.00000
	B	-0.00037	0.00015	0.01202

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)	-0.00203	-0.00245	-0.00247
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00133	-0.00167	-0.00170

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)	0.00246	0.00248	0.00247
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00171	0.00173	0.00172

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)	-0.00112	-0.00112	-0.00112
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00080	-0.00081	-0.00080

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)	0.00116	0.00117	0.00113
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00083	0.00083	0.00081

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00271	0.00281	0.00243	0.85417

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.35104	0.96088

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)	0.04316	0.69727	10.14630
	A1->Y (FR)	0.05365	0.69806	9.93297
	B0->Y (FR)	0.02565	0.57094	8.56936

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)	0.02520	0.37878	5.33550
	A1->Y (RF)	0.02917	0.37796	5.25547
	B0->Y (RF)	0.01915	0.40092	5.82259

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	0.00669	0.00754	0.02849
	A1	0.00000	0.00000	0.00000
	A1	0.00809	0.00825	0.02158
	B0	0.00390	0.00600	0.04823

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	0.00024	0.00047	0.00925
	A1	0.00000	0.00000	0.00000
	A1	0.00145	0.00149	0.01068
	B0	0.00058	0.00106	0.01259

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)	-0.00112	-0.00112	-0.00112
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00247	-0.00251	-0.00251
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00254	-0.00256	-0.00255

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)	0.00117	0.00118	0.00115
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00250	0.00251	0.00251
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00255	0.00257	0.00255

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)	-0.00194	-0.00239	-0.00237
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00244	-0.00249	-0.00249
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00250	-0.00252	-0.00251

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)	0.00237	0.00239	0.00239
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00248	0.00249	0.00249
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00252	0.00253	0.00252

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)	-0.00221	-0.00222	-0.00225

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)	0.00224	0.00228	0.00226

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00255	0.00267	0.00285	0.00282	0.91991

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.02801	0.09969

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)	0.05599	0.69144	9.98689
	A1->Y (FR)	0.04828	0.69458	10.23760
	B0->Y (FR)	0.03017	0.67747	10.22710
	B1->Y (FR)	0.03898	0.67162	9.97816

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)	0.03981	0.41037	5.67741
	A1->Y (RF)	0.03277	0.40072	5.64525
	B0->Y (RF)	0.02717	0.42306	6.14621
	B1->Y (RF)	0.03463	0.43613	6.22952

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	0.01032	0.01050	0.02278
	A1	0.00834	0.00925	0.03204
	B0	0.00489	0.00594	0.02843
	B1	0.00642	0.00622	0.01952

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00092	0.00099	0.01030
	A1	-0.00017	0.00005	0.00899
	B0	-0.00024	0.00029	0.01149
	B1	0.00091	0.00118	0.01227

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)	-0.00200	-0.00239	-0.00241
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00200	-0.00239	-0.00241
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00236	-0.00239	-0.00241
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00242	-0.00243	-0.00243

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)	0.00239	0.00242	0.00241
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00239	0.00242	0.00241
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00239	0.00241	0.00241
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00244	0.00245	0.00244

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)	-0.00109	-0.00109	-0.00109
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00109	-0.00109	-0.00109
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00235	-0.00240	-0.00239
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00242	-0.00244	-0.00242

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)	0.00113	0.00114	0.00110
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00113	0.00114	0.00110
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00238	0.00240	0.00239
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00243	0.00245	0.00243

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)	-0.00110	-0.00111	-0.00110
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00110	-0.00111	-0.00110
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00282	-0.00288	-0.00288
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00284	-0.00285	-0.00289

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)	0.00114	0.00115	0.00112
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00114	0.00115	0.00112
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00291	0.00293	0.00288
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00289	0.00293	0.00290

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)	-0.00198	-0.00239	-0.00239
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00199	-0.00239	-0.00239
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00287	-0.00294	-0.00294
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00289	-0.00291	-0.00295

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)	0.00238	0.00240	0.00239
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00238	0.00241	0.00239
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00296	0.00299	0.00294
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00295	0.00299	0.00296

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00303	0.00279	1.58725
sky130_osu_sc_12T_ms__or2_2	0.00303	0.00279	3.25518
sky130_osu_sc_12T_ms__or2_4	0.00303	0.00279	6.39661
sky130_osu_sc_12T_ms__or2_8	0.00303	0.00280	12.47549
sky130_osu_sc_12T_ms__or2_l	0.00232	0.00217	1.07951

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.03124	0.05016
sky130_osu_sc_12T_ms__or2_2	0.00000	0.04382	0.10000
sky130_osu_sc_12T_ms__or2_4	0.00000	0.06897	0.19969
sky130_osu_sc_12T_ms__or2_8	0.00000	0.11929	0.39907
sky130_osu_sc_12T_ms__or2_l	0.00000	0.52289	0.91130

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)	0.04279	0.41169	5.48380
	B->Y (RR)	0.03751	0.39568	5.44234
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.04599	0.34052	5.43949
	B->Y (RR)	0.04049	0.32584	5.37966
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.05986	0.32311	5.58505
	B->Y (RR)	0.05430	0.31008	5.51663
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.08769	0.34934	5.84922
	B->Y (RR)	0.08213	0.33927	5.77532
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.04470	0.45430	5.30915
	B->Y (RR)	0.04017	0.44170	5.34461

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)	0.06773	0.45236	5.94637
	B->Y (FF)	0.05555	0.44790	6.19876
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.07928	0.43725	6.18936
	B->Y (FF)	0.06739	0.43575	6.43079
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.11160	0.46312	6.45487
	B->Y (FF)	0.09974	0.46713	6.64909
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.17913	0.53738	6.71387
	B->Y (FF)	0.16730	0.54606	6.86052
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.07237	0.46193	5.55671
	B->Y (FF)	0.06121	0.45815	5.81674

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	0.00445	0.00560	0.04220
	B	0.00000	0.00000	0.00000
	B	0.00337	0.00537	0.05099
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00754	0.00899	0.04749
	B	0.00000	0.00000	0.00000
	B	0.00638	0.00868	0.05499
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01472	0.01627	0.05713
	B	0.00000	0.00000	0.00000
	B	0.01350	0.01626	0.06392
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03116	0.03202	0.07338
	B	0.00000	0.00000	0.00000
	B	0.02981	0.03185	0.07892
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00347	0.00490	0.04970
	B	0.00000	0.00000	0.00000
	B	0.00271	0.00532	0.06975

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	0.01032	0.01120	0.05353
	B	0.00000	0.00000	0.00000
	B	0.00861	0.01148	0.08411
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01325	0.01389	0.05652
	B	0.00000	0.00000	0.00000
	B	0.01150	0.01412	0.08574
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02229	0.02062	0.06244
	B	0.00000	0.00000	0.00000
	B	0.02053	0.02078	0.08926
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04881	0.03534	0.07473
	B	0.00000	0.00000	0.00000
	B	0.04716	0.03528	0.09808
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00784	0.00955	0.06225
	B	0.00000	0.00000	0.00000
	B	0.00665	0.01062	0.09566

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)	-0.00206	-0.00250	-0.00250
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00206	-0.00250	-0.00249
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00206	-0.00250	-0.00250
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00206	-0.00251	-0.00250
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00132	-0.00170	-0.00171

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)	0.00248	0.00250	0.00250
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00248	0.00250	0.00250
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00248	0.00250	0.00250
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00248	0.00251	0.00250
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00172	0.00174	0.00173

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)	-0.00113	-0.00113	-0.00113
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00113	-0.00113	-0.00113
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00113	-0.00113	-0.00113
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00112	-0.00113	-0.00113
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00079	-0.00079	-0.00078

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)	0.00117	0.00118	0.00114
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00117	0.00118	0.00114
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00117	0.00118	0.00114
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00117	0.00118	0.00114
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00079

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00292	0.00390	0.92819
sky130_osu_sc_12T_ms__tbufi_l	0.00228	0.00304	0.61799

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.02512	0.09969
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.45570	1.82205

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)	0.02700	0.67662	10.27360
	OE->Y (FR)	0.03078	0.30437	5.34250
	OE->Y (RR)	0.04685	0.48387	5.78534
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.03238	0.71314	9.62877
	OE->Y (FR)	0.03168	0.30436	5.34249
	OE->Y (RR)	0.05089	0.54982	5.75864

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)	0.01721	0.38303	5.69451
	OE->Y (FF)	0.03089	0.30437	5.34247
	OE->Y (RF)	0.01716	0.37672	5.56501
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.01929	0.39878	5.25434
	OE->Y (FF)	0.03191	0.30435	5.34249
	OE->Y (RF)	0.01886	0.38475	5.01609

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	0.00430	0.00535	0.02666
	OE	0.00000	0.00000	0.00000
	OE	0.00420	0.00731	0.09057
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00335	0.00493	0.03743
	OE	0.00000	0.00000	0.00000
	OE	0.00313	0.00741	0.11158

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	-0.00060	-0.00007	0.01041
	OE	0.00000	0.00000	0.00000
	OE	0.00250	0.00604	0.10534
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00035	0.00007	0.01012
	OE	0.00000	0.00000	0.00000
	OE	0.00180	0.00648	0.12075

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)	-0.00204	-0.00206	-0.00205
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00181	-0.00182	-0.00181
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00150	-0.00152	-0.00150
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00133	-0.00134	-0.00133

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)	0.00204	0.00206	0.00205
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00184	0.00185	0.00182
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00150	0.00152	0.00150
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00135	0.00136	0.00134

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)	0.00147	0.00522	0.10724
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00132	0.00542	0.10708
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00108	0.00597	0.12294
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00091	0.00581	0.12281

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)	0.00523	0.00944	0.11108
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00528	0.00955	0.11109
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00407	0.00967	0.12634
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00405	0.00970	0.12638

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00291	0.00424	0.92818
sky130_osu_sc_12T_ms__tnbufi_l	0.00218	0.00327	0.61894

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.04168	0.05000
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.75934	0.91121

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)	0.02712	0.67646	10.27320
	OE->Y (RR)	0.01826	0.30457	5.34268
	OE->Y (FR)	0.03421	0.67156	9.98408
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.03169	0.71244	9.63396
	OE->Y (RR)	0.01979	0.30438	5.34253
	OE->Y (FR)	0.03757	0.71297	9.37068

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)	0.01682	0.38288	5.69446
	OE->Y (RF)	0.01817	0.30456	5.34270
	OE->Y (FF)	0.03378	0.37569	4.81368
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.01832	0.39790	5.25993
	OE->Y (RF)	0.01968	0.30438	5.34254
	OE->Y (FF)	0.03705	0.38522	4.46588

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	0.00448	0.00552	0.02681
	OE	0.00000	0.00000	0.00000
	OE	0.01093	0.01542	0.11547
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00342	0.00499	0.03747
	OE	0.00000	0.00000	0.00000
	OE	0.00844	0.01426	0.12996

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	-0.00083	-0.00028	0.01020
	OE	0.00000	0.00000	0.00000
	OE	0.00942	0.01386	0.09858
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00060	-0.00015	0.00988
	OE	0.00000	0.00000	0.00000
	OE	0.00731	0.01299	0.11847

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)	-0.00165	-0.00166	-0.00165
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00144	-0.00145	-0.00144
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00116	-0.00115	-0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00100	-0.00100	-0.00100

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)	0.00165	0.00166	0.00165
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00146	0.00147	0.00144
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00116	0.00115	0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00103	0.00104	0.00102

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)	-0.00274	0.00110	0.10306
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00275	0.00098	0.10308
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00185	0.00304	0.11980
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00194	0.00297	0.11985

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)	0.00819	0.01336	0.11520
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00809	0.01304	0.11507
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00643	0.01250	0.12947
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00635	0.01245	0.12934

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00584	0.00496	0.96290

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.08471	0.14969

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	0.05961	0.50652	5.93179
	A->Y (FR)	!B	0.03646	0.68332	10.33120
	B->Y (RR)	A	0.04884	0.49818	6.03700
	B->Y (FR)	!A	0.04678	0.68280	10.10700

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	0.05352	0.41451	5.12257
	A->Y (RF)	!B	0.02390	0.38994	5.76070
	B->Y (FF)	A	0.04778	0.41034	5.13358
	B->Y (RF)	!A	0.02871	0.39630	5.75347

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	0.00454	0.00739	0.09640
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01106	0.01622	0.13702
	B	A	0.00000	0.00000	0.00000
	B	A	0.00194	0.00580	0.10992
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01173	0.01602	0.12646

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	0.01304	0.01660	0.11692
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00292	0.00646	0.11509
	B	A	0.00000	0.00000	0.00000
	B	A	0.01195	0.01693	0.11938
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00381	0.00733	0.11438

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00586	0.00501	0.89143

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.08471	0.13815

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	0.06446	0.51699	5.97258
	A->Y (FR)	B	0.04837	0.70245	10.21800
	B->Y (RR)	!A	0.05240	0.51495	5.99827
	B->Y (FR)	A	0.05367	0.70634	10.19160

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	0.05348	0.41237	4.78391
	A->Y (RF)	B	0.02373	0.38698	5.51363
	B->Y (FF)	!A	0.04927	0.40726	4.93018
	B->Y (RF)	A	0.02869	0.38527	5.42692

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	0.01298	0.01707	0.12348
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00291	0.00505	0.10156
	B	A	0.00000	0.00000	0.00000
	B	A	0.01323	0.01730	0.12091
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00190	0.00532	0.10525

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	0.00230	0.00557	0.11070
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01387	0.01772	0.09971
	B	A	0.00000	0.00000	0.00000
	B	A	0.00236	0.00543	0.10604
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01211	0.01636	0.11526

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, 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	0.59611
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	296834.00000	593668.00000
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
	-0.00135	0.06673	1.15365

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
	5.16697	4.95944	1.37856