sky130_osu_sc_12T_ms_tt_1P68_25C.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_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01091	0.01097	0.00838	1.17560	0.51368	1.04552
sky130_osu_sc_12T_ms__addf_l	0.01091	0.01097	0.00839	0.80877	0.51548	1.04551

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.04462	0.05618
sky130_osu_sc_12T_ms__addf_l	0.00000	0.18183	0.33072

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)	0.15482	1.71825	24.48320
	B->CO (RR)	0.15019	1.67667	23.94220
	CI->CO (RR)	0.14569	1.74145	25.02610
	CON->CO (FR)	0.02661	0.74703	11.39180
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.15230	1.57318	19.65010
	B->CO (RR)	0.14805	1.54568	19.47420
	CI->CO (RR)	0.14324	1.59676	20.22560
	CON->CO (FR)	0.03086	0.78930	10.94520

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)	0.23777	2.32405	32.64240
	B->CO (FF)	0.21209	2.22168	31.37090
	CI->CO (FF)	0.21048	2.30228	32.86790
	CON->CO (RF)	0.02161	0.57285	8.73162
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.23245	2.07087	25.38670
	B->CO (FF)	0.20800	1.98574	24.50490
	CI->CO (FF)	0.20516	2.04987	25.62860
	CON->CO (RF)	0.02419	0.59893	8.41545

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)	0.18151	1.02907	10.80450
	B->CON (FR)	0.15627	0.96990	10.45700
	CI->CON (FR)	0.15421	1.00896	11.07900
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.17265	1.02157	10.81860
	B->CON (FR)	0.14814	0.96290	10.47150
	CI->CON (FR)	0.14536	1.00150	11.09430

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)	0.09550	0.60401	6.63752
	B->CON (RF)	0.09232	0.61324	6.96267
	CI->CON (RF)	0.08629	0.62994	7.25939
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.09246	0.60161	6.64755
	B->CON (RF)	0.08942	0.61099	6.97243
	CI->CON (RF)	0.08324	0.62757	7.26990

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)	0.34275	2.12418	25.00850
	B->S (-R)	0.34816	2.10571	24.30830
	CI->S (-R)	0.31333	2.09787	25.22420
	CON->S (RR)	0.08706	0.69776	7.31624
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.33025	2.11458	24.99900
	B->S (-R)	0.33610	2.09675	24.30020
	CI->S (-R)	0.30082	2.08847	25.21380
	CON->S (RR)	0.08710	0.69773	7.31620

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)	0.26685	1.49846	16.38370
	B->S (-F)	0.26089	1.44237	16.12800
	CI->S (-F)	0.25706	1.51812	16.93430
	CON->S (FF)	0.11275	0.66488	6.08370
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.26048	1.49411	16.38120
	B->S (-F)	0.25473	1.43780	16.12390
	CI->S (-F)	0.25057	1.51356	16.93070
	CON->S (FF)	0.11279	0.66483	6.08343

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	0.00213	0.00232	0.00643
	B	0.00308	0.00316	0.00667
	CI	0.00308	0.00334	0.00753
sky130_osu_sc_12T_ms__addf_l	A	0.00189	0.00202	0.00519
	B	0.00284	0.00286	0.00555
	CI	0.00284	0.00305	0.00611

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00762	0.00799	0.01680
	B	0.00800	0.00834	0.01594
	CI	0.00647	0.00689	0.01585
sky130_osu_sc_12T_ms__addf_l	A	0.00743	0.00769	0.01340
	B	0.00778	0.00803	0.01285
	CI	0.00628	0.00656	0.01255

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00761	0.00778	0.01135
	B	0.00793	0.00797	0.01113
	CI	0.00702	0.00729	0.01063
sky130_osu_sc_12T_ms__addf_l	A	0.00742	0.00757	0.01105
	B	0.00773	0.00778	0.01084
	CI	0.00682	0.00708	0.01034

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00253	0.00243	0.00405
	B	0.00305	0.00305	0.00490
	CI	0.00307	0.00323	0.00539
sky130_osu_sc_12T_ms__addf_l	A	0.00188	0.00197	0.00409
	B	0.00281	0.00281	0.00483
	CI	0.00283	0.00300	0.00532

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00761	0.00795	0.01564
	B	0.00799	0.00829	0.01497
	CI	0.00647	0.00687	0.01475
sky130_osu_sc_12T_ms__addf_l	A	0.00743	0.00773	0.01521
	B	0.00778	0.00807	0.01453
	CI	0.00628	0.00666	0.01432

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01657	0.01656	0.02182
	B	0.01517	0.01497	0.02289
	CI	0.01367	0.01350	0.01853
sky130_osu_sc_12T_ms__addf_l	A	0.01657	0.01657	0.02183
	B	0.01518	0.01498	0.02290
	CI	0.01367	0.01351	0.01853

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.00537	0.00564	1.14406	1.16270	1.18007
sky130_osu_sc_12T_ms__addh_l	0.00537	0.00564	0.79980	1.16709	0.81659

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.05279	0.05596
sky130_osu_sc_12T_ms__addh_l	0.00000	0.32719	0.33030

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)	0.10516	0.70396	7.24727
	B->CO (RR)	0.10832	0.70045	7.31843
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.10274	0.74154	7.01302
	B->CO (RR)	0.10590	0.74120	7.07752

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)	0.09151	0.64270	6.46924
	B->CO (FF)	0.09644	0.65948	6.51966
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.09044	0.66761	6.23382
	B->CO (FF)	0.09523	0.68429	6.29667

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)	0.14751	0.72328	7.15820
	B->CON (RR)	0.15034	0.71942	7.22953
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.13698	0.70845	7.14062
	B->CON (RR)	0.13989	0.70544	7.20824

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)	0.12258	0.66472	6.52405
	B->CON (FF)	0.12103	0.67566	6.56518
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.11388	0.64538	6.40844
	B->CON (FF)	0.11245	0.65627	6.44944

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)	0.17100	1.40422	17.37320
	B->S (FR)	0.16951	1.41467	17.45780
	CON->S (FR)	0.02824	0.75751	11.57070
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.16302	1.31330	14.17450
	B->S (FR)	0.16164	1.32437	14.23300
	CON->S (FR)	0.03151	0.79327	11.04640

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)	0.18876	1.37868	16.81760
	B->S (RF)	0.19156	1.37486	16.88860
	CON->S (RF)	0.02117	0.57297	8.78251
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.18025	1.25820	13.12730
	B->S (RF)	0.18316	1.25498	13.18940
	CON->S (RF)	0.02365	0.60032	8.49371

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	0.00393	0.00380	0.00649
	B	0.00000	0.00000	0.00000
	B	0.00360	0.00344	0.00622
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00348	0.00331	0.00625
	B	0.00000	0.00000	0.00000
	B	0.00315	0.00294	0.00592

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	0.00552	0.00541	0.00870
	B	0.00000	0.00000	0.00000
	B	0.00578	0.00592	0.00944
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00505	0.00495	0.00850
	B	0.00000	0.00000	0.00000
	B	0.00532	0.00542	0.00911

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	0.00393	0.00380	0.00648
	B	0.00000	0.00000	0.00000
	B	0.00360	0.00344	0.00624
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00348	0.00331	0.00617
	B	0.00000	0.00000	0.00000
	B	0.00315	0.00294	0.00584

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	0.00552	0.00541	0.00877
	B	0.00000	0.00000	0.00000
	B	0.00578	0.00592	0.00946
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00506	0.00494	0.00855
	B	0.00000	0.00000	0.00000
	B	0.00532	0.00543	0.00905

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	0.00553	0.00542	0.00884
	B	0.00000	0.00000	0.00000
	B	0.00579	0.00592	0.00913
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00506	0.00496	0.00859
	B	0.00000	0.00000	0.00000
	B	0.00533	0.00543	0.00906

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	0.00392	0.00380	0.00652
	B	0.00000	0.00000	0.00000
	B	0.00360	0.00344	0.00623
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00347	0.00331	0.00634
	B	0.00000	0.00000	0.00000
	B	0.00315	0.00294	0.00600

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)	1.08887	1.04087	0.31915
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.08895	1.04096	0.31923

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)	1.08875	1.04069	0.32867
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.08883	1.04077	0.32875

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00287	0.00297	1.13925
sky130_osu_sc_12T_ms__and2_2	0.00286	0.00297	2.26216
sky130_osu_sc_12T_ms__and2_4	0.00287	0.00297	4.37335
sky130_osu_sc_12T_ms__and2_6	0.00290	0.00297	6.47014
sky130_osu_sc_12T_ms__and2_8	0.00287	0.00297	8.48319
sky130_osu_sc_12T_ms__and2_l	0.00218	0.00225	0.80316

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.02326	0.03713
sky130_osu_sc_12T_ms__and2_2	0.00000	0.03714	0.03744
sky130_osu_sc_12T_ms__and2_4	0.00000	0.06491	0.07395
sky130_osu_sc_12T_ms__and2_6	0.00000	0.09268	0.11077
sky130_osu_sc_12T_ms__and2_8	0.00000	0.12045	0.14759
sky130_osu_sc_12T_ms__and2_l	0.00000	0.36638	0.58614

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)	0.07997	0.63808	7.00948
	B->Y (RR)	0.08505	0.64134	6.98188
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.09026	0.57748	7.10836
	B->Y (RR)	0.09533	0.57583	7.08413
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.12349	0.58562	7.36582
	B->Y (RR)	0.12848	0.57494	7.34839
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.15672	0.61935	7.60878
	B->Y (RR)	0.16164	0.60283	7.58595
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.18857	0.65677	7.83680
	B->Y (RR)	0.19362	0.63801	7.80379
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.08389	0.69307	7.09618
	B->Y (RR)	0.08878	0.69454	7.00445

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)	0.07255	0.56947	5.89517
	B->Y (FF)	0.07466	0.58403	5.93607
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.08388	0.54849	6.06568
	B->Y (FF)	0.08543	0.55702	6.11487
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.11771	0.57898	6.38354
	B->Y (FF)	0.11703	0.58113	6.42021
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.15329	0.62343	6.64539
	B->Y (FF)	0.15014	0.61962	6.67503
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.18655	0.66196	6.81277
	B->Y (FF)	0.18131	0.65419	6.84198
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.07274	0.57988	5.54402
	B->Y (FF)	0.07835	0.59707	5.58005

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	0.00269	0.00252	0.01350
	B	0.00000	0.00000	0.00000
	B	0.00274	0.00236	0.00921
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00506	0.00507	0.01572
	B	0.00000	0.00000	0.00000
	B	0.00511	0.00499	0.01164
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01051	0.01084	0.02096
	B	0.00000	0.00000	0.00000
	B	0.01058	0.01080	0.01724
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01622	0.01668	0.02678
	B	0.00000	0.00000	0.00000
	B	0.01629	0.01663	0.02382
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02190	0.02257	0.03240
	B	0.00000	0.00000	0.00000
	B	0.02196	0.02232	0.02976
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00208	0.00208	0.01675
	B	0.00000	0.00000	0.00000
	B	0.00212	0.00193	0.01235

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	0.00686	0.00725	0.01753
	B	0.00000	0.00000	0.00000
	B	0.00777	0.00798	0.01763
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00860	0.00931	0.01949
	B	0.00000	0.00000	0.00000
	B	0.00955	0.01004	0.01964
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01303	0.01435	0.02438
	B	0.00000	0.00000	0.00000
	B	0.01396	0.01493	0.02442
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01772	0.01942	0.02945
	B	0.00000	0.00000	0.00000
	B	0.01862	0.02004	0.02939
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02253	0.02426	0.03439
	B	0.00000	0.00000	0.00000
	B	0.02331	0.02480	0.03414
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00519	0.00574	0.01995
	B	0.00000	0.00000	0.00000
	B	0.00584	0.00629	0.01988

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)	-0.00236	-0.00236	-0.00238
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00235	-0.00236	-0.00238
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00235	-0.00236	-0.00238
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00237	-0.00239	-0.00240
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00235	-0.00236	-0.00237
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00165	-0.00166	-0.00167

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)	0.00237	0.00240	0.00238
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00237	0.00240	0.00238
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00237	0.00240	0.00238
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00240	0.00242	0.00241
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00237	0.00240	0.00239
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00167	0.00169	0.00168

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)	-0.00224	-0.00225	-0.00224
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00224	-0.00225	-0.00224
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00224	-0.00225	-0.00224
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00224	-0.00225	-0.00224
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00224	-0.00225	-0.00224
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00158	-0.00158	-0.00158

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)	0.00227	0.00228	0.00225
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00227	0.00228	0.00225
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00227	0.00228	0.00225
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00227	0.00227	0.00225
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00227	0.00227	0.00225
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00160	0.00161	0.00159

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00262	0.00280	0.00276	0.49160

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00939	0.01841

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)	0.09386	0.95222	10.69790
	A1->Y (FR)	0.07474	0.87431	10.09870
	B0->Y (FR)	0.07191	0.94241	11.08270

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)	0.04860	0.54042	6.33036
	A1->Y (RF)	0.04467	0.55802	6.75038
	B0->Y (RF)	0.02918	0.51659	6.45885

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	0.00578	0.00558	0.00651
	A1	0.00000	0.00000	0.00000
	A1	0.00487	0.00476	0.00552
	B0	0.00362	0.00369	0.00553

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	0.00122	0.00102	0.00175
	A1	0.00000	0.00000	0.00000
	A1	0.00125	0.00107	0.00209
	B0	-0.00047	-0.00045	0.00048

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)	-0.00168	-0.00194	-0.00192
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00195	-0.00197	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00195	-0.00196	-0.00196

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)	0.00192	0.00194	0.00192
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00195	0.00198	0.00196
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00199	0.00198	0.00196

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)	-0.00168	-0.00193	-0.00193
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00195	-0.00197	-0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00215	-0.00216	-0.00217

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)	0.00192	0.00194	0.00193
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00195	0.00199	0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00217	0.00221	0.00218

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)	-0.00092	-0.00094	-0.00093

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)	0.00102	0.00103	0.00095

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00262	0.00280	0.00293	0.00274	0.48285

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.01067	0.03682

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)	0.12027	0.98248	10.64690
	A1->Y (FR)	0.10687	0.96318	10.58990
	B0->Y (FR)	0.07587	0.94243	10.97000
	B1->Y (FR)	0.08968	0.95432	11.04100

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)	0.06337	0.55346	6.28474
	A1->Y (RF)	0.05936	0.57178	6.70359
	B0->Y (RF)	0.03423	0.54196	6.67093
	B1->Y (RF)	0.03871	0.52378	6.25542

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	0.00698	0.00690	0.00761
	A1	0.00607	0.00595	0.00668
	B0	0.00394	0.00395	0.00604
	B1	0.00593	0.00563	0.00779

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00244	0.00224	0.00296
	A1	0.00247	0.00230	0.00331
	B0	-0.00030	-0.00032	0.00074
	B1	-0.00025	-0.00034	0.00043

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)	-0.00171	-0.00193	-0.00192
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00195	-0.00197	-0.00195
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00195	-0.00196	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00195	-0.00196	-0.00195

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)	0.00192	0.00193	0.00192
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00195	0.00198	0.00196
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00198	0.00197	0.00196
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00198	0.00197	0.00196

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)	-0.00171	-0.00194	-0.00193
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00195	-0.00197	-0.00196
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00214	-0.00216	-0.00216
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00214	-0.00216	-0.00216

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)	0.00192	0.00195	0.00193
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00195	0.00199	0.00197
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00215	0.00219	0.00217
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00216	0.00219	0.00217

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)	-0.00093	-0.00093	-0.00092
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00092	-0.00093	-0.00092
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00225	-0.00226	-0.00226
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00225	-0.00226	-0.00227

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)	0.00106	0.00107	0.00096
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00092	0.00093	0.00092
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00226	0.00227	0.00227
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00226	0.00227	0.00227

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)	-0.00094	-0.00095	-0.00094
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00093	-0.00094	-0.00094
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00206	-0.00208	-0.00206
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00206	-0.00206	-0.00206

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)	0.00107	0.00108	0.00097
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00094	0.00094	0.00094
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00209	0.00208	0.00207
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00209	0.00208	0.00207

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.00298	1.06973
sky130_osu_sc_12T_ms__buf_2	0.00298	2.19852
sky130_osu_sc_12T_ms__buf_4	0.00298	4.34952
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00298	8.54838
sky130_osu_sc_12T_ms__buf_l	0.00222	0.81048

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.01872	0.01872
sky130_osu_sc_12T_ms__buf_2	0.00000	0.02808	0.03713
sky130_osu_sc_12T_ms__buf_4	0.00000	0.04680	0.07395
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.08423	0.14759
sky130_osu_sc_12T_ms__buf_l	0.00000	0.29314	0.29315

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)**	0.06137	0.61919	6.88400
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.06525	0.53765	6.93053
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.08736	0.52609	7.20478
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.13078	0.56994	7.62965
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.06385	0.65938	6.93390

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)**	0.06819	0.55085	5.59585
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.07968	0.53772	5.93439
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.11338	0.57302	6.35198
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.18156	0.65533	6.85464
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.07053	0.57646	5.60310

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	0.00258	0.00235	0.01000
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00492	0.00484	0.01233
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01030	0.01065	0.01847
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02127	0.02220	0.03129
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00200	0.00196	0.01447

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	0.00665	0.00695	0.01672
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00838	0.00890	0.01844
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01282	0.01377	0.02315
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02232	0.02392	0.03288
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00512	0.00564	0.02017

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
	-0.00058	-0.00058	-0.00056

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
	0.00058	0.00058	0.00056

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.00273	0.00273	0.00879	1.12969	1.12830
sky130_osu_sc_12T_ms__dffnr_l	0.00273	0.00273	0.00879	0.81282	0.80660

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.20826	0.44601
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.48269	0.72044

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)	0.40146	1.60307	16.31160
	QN->Q (FR)	0.03078	0.82345	12.43550
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.39485	1.69119	15.90430
	QN->Q (FR)	0.03321	0.84463	11.71200

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)	0.25848	1.47675	17.20060
	QN->Q (RF)	0.02349	0.61288	9.30367
	RN->Q (FF)	0.24104	1.49094	17.30380
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.26077	1.61199	17.12870
	QN->Q (RF)	0.02546	0.63894	8.98168
	RN->Q (FF)	0.24352	1.62656	17.22940

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)	0.22269	0.85725	8.16228
	RN->QN (FR)	0.20519	0.87148	8.26269
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.22002	0.91001	8.09916
	RN->QN (FR)	0.20263	0.92413	8.19716

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)**	0.35335	0.90885	6.21454
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.34475	0.93003	6.13879

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)	-0.10282	-0.23886	-0.71120
	setup	CK (F)	0.18466	0.25679	0.74275
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.10315	-0.23886	-0.71114
	setup	CK (F)	0.18504	0.25687	0.74289

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)	-0.08373	-0.11035	-0.39426
	setup	CK (F)	0.19395	0.22796	0.76365
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.08340	-0.10958	-0.39724
	setup	CK (F)	0.19386	0.22798	0.76754

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)	-0.10282	-0.23886	-0.71120
	setup	CK (F)	0.18466	0.25679	0.74275
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.10315	-0.23886	-0.71114
	setup	CK (F)	0.18504	0.25687	0.74289

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)	-0.08373	-0.11035	-0.39426
	setup	CK (F)	0.19395	0.22796	0.76365
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.08340	-0.10958	-0.39724
	setup	CK (F)	0.19386	0.22798	0.76754

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)	0.15033	0.14029	-0.69169
	removal	CK (F)	-0.10075	-0.11225	0.69932
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.15065	0.14057	-0.68822
	removal	CK (F)	-0.10075	-0.11225	0.69932

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)	0.15033	0.14029	-0.69169
	removal	CK (F)	-0.10075	-0.11225	0.69932
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.15065	0.14057	-0.68822
	removal	CK (F)	-0.10075	-0.11225	0.69932

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 ()	0.15003	0.42725	13.33370
	min_pulse_width	RN ()	0.15003	0.42725	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.14358	0.42725	13.33370
	min_pulse_width	RN ()	0.14358	0.42725	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 ()	0.17904	0.42725	13.33370
	min_pulse_width	CK ()	0.23384	0.42725	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.17904	0.42725	13.33370
	min_pulse_width	CK ()	0.23384	0.42725	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 ()	0.17582	0.42725	13.33370
	min_pulse_width	CK ()	0.13069	0.42725	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.16937	0.42725	13.33370
	min_pulse_width	CK ()	0.12747	0.42725	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	0.01292	0.01206	0.00302
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01224	0.01167	0.00992

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	0.01281	0.01195	0.00949
	RN	-0.00089	-0.05250	-0.79711
	RN	0.01692	0.01597	0.00886
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01211	0.01155	0.01556
	RN	-0.00089	-0.04309	-0.57353
	RN	0.01621	0.01559	0.01477

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	0.01280	0.01194	0.00946
	RN	-0.00089	-0.05246	-0.79612
	RN	0.01692	0.01596	0.00884
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01211	0.01157	0.01554
	RN	-0.00089	-0.04289	-0.56914
	RN	0.01621	0.01558	0.01490

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	0.01289	0.01203	0.00328
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01221	0.01165	0.00982

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)	0.00832	0.00790	0.01410
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00271	0.00236	0.00867
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00185	-0.00215	-0.00216
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)	0.00833	0.00790	0.01410
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00271	0.00236	0.00868
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00184	-0.00214	-0.00216

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)	0.01300	0.01274	0.01923
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00703	0.00682	0.01317
	!CK	0.00000	0.00000	0.00000
	!CK	0.00215	0.00217	0.00216
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)	0.01300	0.01275	0.01923
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00703	0.00683	0.01317
	!CK	0.00000	0.00000	0.00000
	!CK	0.00215	0.00218	0.00217

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)	0.00841	0.00791	0.01946
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00264	0.00234	0.01346
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00842	0.00791	0.01947
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00264	0.00234	0.01346

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)	0.01297	0.01278	0.02445
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00683	0.00687	0.01852
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01298	0.01278	0.02446
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00683	0.00687	0.01853

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)	-0.00033	-0.00083	0.01013
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00906	0.00804	0.02573
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00247	0.00172	0.02320
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01089	0.01009	0.02427
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00025	-0.00078	0.01017
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00032	-0.00083	0.01013
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00906	0.00804	0.02574
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00247	0.00172	0.02320
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01089	0.01009	0.02428
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00025	-0.00078	0.01017

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)	0.01061	0.01051	0.02227
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01377	0.01376	0.03601
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01133	0.01124	0.02267
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01061	0.01051	0.02227
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01377	0.01376	0.03602
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01133	0.01124	0.02267

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00274	0.00273	0.00862	1.12994	1.12765
sky130_osu_sc_12T_ms__dffr_l	0.00274	0.00273	0.00861	0.81336	0.80653

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.20826	0.44626
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.48269	0.72069

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)	0.32400	1.41559	14.99790
	QN->Q (FR)	0.03078	0.82352	12.43720
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.31720	1.50423	14.60700
	QN->Q (FR)	0.03321	0.84462	11.71680

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)	0.32785	1.48036	16.14590
	QN->Q (RF)	0.02348	0.61292	9.30477
	RN->Q (FF)	0.24139	1.49188	17.30800
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.33004	1.61685	16.09210
	QN->Q (RF)	0.02546	0.63910	8.98486
	RN->Q (FF)	0.24385	1.62768	17.23820

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)	0.29209	0.86065	7.10016
	RN->QN (FR)	0.20543	0.87207	8.26045
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.28932	0.91414	7.05112
	RN->QN (FR)	0.20289	0.92481	8.19802

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)**	0.27583	0.72115	4.90319
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.26704	0.74236	4.82436

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)	-0.05918	-0.07797	-0.18623
	setup	CK (R)	0.25075	0.27249	1.12516
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.06117	-0.08015	-0.18568
	setup	CK (R)	0.25090	0.27452	1.14057

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)	-0.13065	-0.35000	-3.15522
	setup	CK (R)	0.15793	0.36111	3.23728
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12995	-0.35044	-3.15148
	setup	CK (R)	0.15788	0.36111	3.23728

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)	-0.05918	-0.07797	-0.18623
	setup	CK (R)	0.25075	0.27249	1.12516
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.06117	-0.08015	-0.18568
	setup	CK (R)	0.25090	0.27452	1.14057

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)	-0.13065	-0.35000	-3.15522
	setup	CK (R)	0.15793	0.36111	3.23728
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12995	-0.35044	-3.15148
	setup	CK (R)	0.15788	0.36111	3.23728

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)	0.21539	0.24225	1.19985
	removal	CK (R)	-0.03920	-0.04831	-0.07989
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.21660	0.24311	1.21262
	removal	CK (R)	-0.03920	-0.04831	-0.07989

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)	0.21539	0.24225	1.19985
	removal	CK (R)	-0.03920	-0.04831	-0.07989
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.21660	0.24311	1.21262
	removal	CK (R)	-0.03920	-0.04831	-0.07989

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 ()	0.15003	0.42725	13.33370
	min_pulse_width	RN ()	0.15003	0.42725	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.14358	0.42725	13.33370
	min_pulse_width	RN ()	0.14681	0.42725	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 ()	0.14358	0.42725	13.33370
	min_pulse_width	CK ()	0.17260	0.42725	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.13714	0.42725	13.33370
	min_pulse_width	CK ()	0.16937	0.42725	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 ()	0.32087	0.42725	13.33370
	min_pulse_width	CK ()	0.13069	0.42725	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.32087	0.42725	13.33370
	min_pulse_width	CK ()	0.13069	0.42725	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	0.00681	0.00556	0.00000
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00613	0.00518	0.00689

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	0.00771	0.00658	0.00000
	RN	-0.00089	-0.05251	-0.79728
	RN	0.01761	0.01666	0.00954
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00701	0.00620	0.00506
	RN	-0.00089	-0.04311	-0.57390
	RN	0.01691	0.01627	0.01544

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	0.00771	0.00657	-0.00015
	RN	-0.00089	-0.05244	-0.79566
	RN	0.01761	0.01665	0.00953
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00701	0.00619	0.00507
	RN	-0.00089	-0.04289	-0.56908
	RN	0.01691	0.01626	0.01559

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	0.00678	0.00554	0.00015
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00610	0.00515	0.00656

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	-0.00162	-0.00194	-0.00195
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00851	0.00808	0.01427
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00338	0.00302	0.00933
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00162	-0.00193	-0.00195
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00851	0.00808	0.01426
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00338	0.00302	0.00933

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	0.00193	0.00196	0.00195
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01283	0.01255	0.01907
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00636	0.00614	0.01252
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00193	0.00196	0.00195
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01283	0.01255	0.01907
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00637	0.00614	0.01252

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)	0.00264	0.00233	0.01346
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00797	0.00747	0.01903
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)	0.00264	0.00234	0.01347
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00798	0.00747	0.01903

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)	0.00682	0.00686	0.01852
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01341	0.01321	0.02489
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)	0.00683	0.00687	0.01852
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01341	0.01321	0.02489

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)	-0.00049	-0.00093	0.01007
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00434	0.00340	0.01466
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00053	-0.00094	0.01003
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00049	-0.00093	0.01007
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00435	0.00339	0.01466
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00052	-0.00094	0.01003

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)	0.01039	0.01037	0.02217
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02124	0.02068	0.03338
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01587	0.01565	0.02719
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02073	0.02062	0.04161
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01124	0.01117	0.02269
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01040	0.01038	0.02218
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02124	0.02068	0.03339
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01588	0.01565	0.02719
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02073	0.02056	0.04161
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01124	0.01117	0.02269

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00270	0.00274	0.00640	0.00868	1.18216	1.17726
sky130_osu_sc_12T_ms__dffsr_l	0.00270	0.00274	0.00640	0.00868	0.80130	0.80695

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.06868	0.09408
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.34310	0.36850

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)	0.34776	1.46320	15.52370
	QN->Q (FR)	0.02893	0.79804	12.20050
	RN->Q (RR)	0.27932	1.40647	15.55370
	SN->Q (FR)	0.26053	1.47629	16.94490
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.34625	1.53819	14.49450
	QN->Q (FR)	0.03313	0.83962	11.60660
	RN->Q (RR)	0.27879	1.48363	14.52220
	SN->Q (FR)	0.25888	1.55022	15.89640

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)	0.37845	1.54243	16.58050
	QN->Q (RF)	0.02331	0.62350	9.53182
	RN->Q (FF)	0.25447	1.51844	17.73740
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.38212	1.66371	15.92770
	QN->Q (RF)	0.02532	0.63501	8.90623
	RN->Q (FF)	0.25868	1.63981	17.06910

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)	0.34197	0.91335	7.21272
	RN->QN (FR)	0.21883	0.88824	8.38095
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.34047	0.97199	7.12597
	RN->QN (FR)	0.21765	0.94781	8.26851

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)	0.30182	0.76757	5.19685
	RN->QN (RF)	0.23536	0.71457	5.23674
	SN->QN (FF)	0.21495	0.78140	6.61643
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.29698	0.78605	4.92564
	RN->QN (RF)	0.23065	0.73348	4.96135
	SN->QN (FF)	0.21013	0.79874	6.32755

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)	-0.07217	-0.09310	-0.26626
	setup	CK (R)	0.26198	0.28093	1.14776
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.07004	-0.09400	-0.26695
	setup	CK (R)	0.26309	0.28125	1.15243

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)	-0.15282	-0.36948	-3.26913
	setup	CK (R)	0.18659	0.38191	3.33002
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15114	-0.37026	-3.26965
	setup	CK (R)	0.18630	0.38191	3.32996

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)	-0.07217	-0.09310	-0.26626
	setup	CK (R)	0.26198	0.28093	1.14776
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.07004	-0.09400	-0.26695
	setup	CK (R)	0.26309	0.28125	1.15243

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)	-0.15282	-0.36948	-3.26913
	setup	CK (R)	0.18659	0.38191	3.33002
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15114	-0.37026	-3.26965
	setup	CK (R)	0.18630	0.38191	3.32996

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)	0.20919	0.22775	1.15513
	removal	CK (R)	-0.03188	-0.03717	-0.09326
	hold	SN (R)	-0.20736	-0.36867	-1.72260
	setup	SN (R)	0.23456	0.40731	5.01328
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.20960	0.22809	1.15757
	removal	CK (R)	-0.03188	-0.03717	-0.09326
	hold	SN (R)	-0.19869	-0.35805	-1.67542
	setup	SN (R)	0.23057	0.39794	4.92732

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)	0.20919	0.22775	1.15513
	removal	CK (R)	-0.03188	-0.03717	-0.09326
	hold	SN (R)	-0.20736	-0.36867	-1.72260
	hold	SN (R)	-0.20904	-0.36867	-1.72742
	setup	SN (R)	0.23111	0.40616	4.81233
	setup	SN (R)	0.23456	0.40731	5.01328
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.20960	0.22809	1.15757
	removal	CK (R)	-0.03188	-0.03717	-0.09326
	hold	SN (R)	-0.19869	-0.35805	-1.67542
	hold	SN (R)	-0.20015	-0.36055	-1.68373
	setup	SN (R)	0.23057	0.39577	4.66285
	setup	SN (R)	0.22212	0.39794	4.92732

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 ()	0.16937	0.42725	13.33370
	min_pulse_width	RN ()	0.17582	0.42725	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.16937	0.42725	13.33370
	min_pulse_width	RN ()	0.16937	0.42725	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)	0.04395	0.07715	4.31890
	removal	CK (R)	-0.01818	-0.05490	-0.33038
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.04367	0.07704	4.15910
	removal	CK (R)	-0.01818	-0.05490	-0.33038

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)	0.04395	0.07715	4.31890
	removal	CK (R)	-0.01818	-0.05490	-0.33038
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.04367	0.07704	4.15910
	removal	CK (R)	-0.01818	-0.05490	-0.33038

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 ()	0.20483	0.42725	13.33370
	min_pulse_width	SN ()	0.21450	0.42725	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.20483	0.42725	13.33370
	min_pulse_width	SN ()	0.20161	0.42725	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 ()	0.15648	0.42725	13.33370
	min_pulse_width	CK ()	0.19516	0.42725	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.15003	0.42725	13.33370
	min_pulse_width	CK ()	0.19194	0.42725	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 ()	0.33699	0.42725	13.33370
	min_pulse_width	CK ()	0.16293	0.42725	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.33699	0.42725	13.33370
	min_pulse_width	CK ()	0.16293	0.42725	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	0.00846	0.00722	0.00095
	RN	0.01544	0.01433	0.00468
	SN	-0.00089	-0.05395	-0.83413
	SN	0.01721	0.01594	0.00531
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00782	0.00690	0.00846
	RN	0.01479	0.01403	0.01198
	SN	-0.00089	-0.04272	-0.56539
	SN	0.01656	0.01563	0.01302

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	0.00896	0.00812	0.00377
	RN	-0.00089	-0.05395	-0.83413
	RN	0.01854	0.01789	0.01399
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00828	0.00754	0.00653
	RN	-0.00089	-0.04272	-0.56539
	RN	0.01784	0.01729	0.01650

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	0.00896	0.00813	0.00382
	RN	-0.00089	-0.05381	-0.83067
	RN	0.01854	0.01788	0.01470
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00827	0.00753	0.00648
	RN	-0.00089	-0.04290	-0.56939
	RN	0.01784	0.01728	0.01658

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	0.00843	0.00719	0.00094
	RN	0.01541	0.01431	0.00454
	SN	-0.00089	-0.05381	-0.83064
	SN	0.01718	0.01591	0.00567
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00779	0.00687	0.00806
	RN	0.01476	0.01399	0.01178
	SN	-0.00089	-0.04290	-0.56937
	SN	0.01653	0.01558	0.01283

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	-0.00192	-0.00196	-0.00196
	(!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)	0.01069	0.01029	0.01639
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00369	0.00334	0.00952
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00367	0.00333	0.00952
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00371	0.00336	0.00955
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00192	-0.00196	-0.00196
	(!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)	0.01069	0.01029	0.01639
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00369	0.00334	0.00953
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00367	0.00333	0.00952
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00371	0.00336	0.00955

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	0.00198	0.00197	0.00196
	(!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)	0.01481	0.01453	0.02070
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00693	0.00675	0.01305
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00698	0.00680	0.01306
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00691	0.00673	0.01303
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00198	0.00198	0.00196
	(!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)	0.01481	0.01453	0.02070
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00693	0.00675	0.01306
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00698	0.00680	0.01306
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00691	0.00673	0.01303

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)	0.00213	0.00181	0.01279
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00942	0.00885	0.01983
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)	0.00213	0.00181	0.01279
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00942	0.00886	0.01983

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)	0.00741	0.00751	0.01927
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01419	0.01395	0.02558
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)	0.00741	0.00751	0.01927
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01419	0.01396	0.02558

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)	-0.00500	-0.00502	-0.00503
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00492	-0.00545	-0.00542
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00479	-0.00503	-0.00504
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00242	0.00205	0.00897
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)	-0.00500	-0.00502	-0.00503
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00492	-0.00545	-0.00542
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00479	-0.00503	-0.00503
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00242	0.00206	0.00897

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)	0.00502	0.00513	0.00504
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00541	0.00545	0.00542
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00501	0.00503	0.00504
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01158	0.01126	0.01718
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)	0.00502	0.00514	0.00505
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00541	0.00546	0.00543
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00501	0.00503	0.00505
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01158	0.01127	0.01718

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)	-0.00054	-0.00099	0.00997
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00510	0.00421	0.01542
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00503	0.00412	0.01537
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00040	-0.00081	0.01012
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00251	0.00193	0.02297
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00054	-0.00099	0.00997
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00511	0.00421	0.01542
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00503	0.00412	0.01538
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00040	-0.00080	0.01012
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00251	0.00193	0.02297

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)	0.02370	0.02319	0.03575
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01062	0.01056	0.02236
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01612	0.01596	0.02742
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01617	0.01596	0.02740
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02283	0.02254	0.04338
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01125	0.01112	0.02266
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01424	0.01416	0.03649
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02370	0.02319	0.03575
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01062	0.01056	0.02236
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01613	0.01596	0.02742
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01617	0.01596	0.02740
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02283	0.02255	0.04338
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01125	0.01117	0.02267
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01422	0.01416	0.03649

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00271	0.00526	0.00858	1.13463	1.13661
sky130_osu_sc_12T_ms__dffs_l	0.00271	0.00526	0.00858	0.80864	0.81172

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.43622	1.21007
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.71065	1.48449

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)	0.24105	1.31985	14.92800
	QN->Q (FR)	0.03076	0.82156	12.42280
	SN->Q (FR)	0.18783	1.37919	16.00710
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.24047	1.41242	14.40230
	QN->Q (FR)	0.03316	0.84074	11.64670
	SN->Q (FR)	0.18719	1.46572	15.44900

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)	0.36350	1.52230	16.21920
	QN->Q (RF)	0.02338	0.61316	9.30029
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.36270	1.64771	16.01780
	QN->Q (RF)	0.02538	0.63599	8.93892

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)	0.32622	0.90310	7.17587
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.32053	0.95206	7.11819

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)	0.19829	0.62759	4.82920
	SN->QN (FF)	0.14425	0.68717	5.90399
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.19493	0.65756	4.75143
	SN->QN (FF)	0.14104	0.71188	5.79587

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)	-0.04969	-0.06624	-0.15603
	setup	CK (R)	0.17453	0.20480	1.14754
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04660	-0.06671	-0.15949
	setup	CK (R)	0.17467	0.20475	1.15542

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)	-0.13820	-0.35452	-3.16073
	setup	CK (R)	0.17778	0.36752	3.26825
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.13629	-0.35433	-3.15861
	setup	CK (R)	0.17778	0.36752	3.26823

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)	-0.04969	-0.06624	-0.15603
	setup	CK (R)	0.17453	0.20480	1.14754
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04660	-0.06671	-0.15949
	setup	CK (R)	0.17467	0.20475	1.15542

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)	-0.13820	-0.35452	-3.16073
	setup	CK (R)	0.17778	0.36752	3.26825
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.13629	-0.35433	-3.15861
	setup	CK (R)	0.17778	0.36752	3.26823

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)	0.04804	0.07534	3.12327
	removal	CK (R)	-0.02374	-0.05490	-0.43504
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04818	0.07531	2.98902
	removal	CK (R)	-0.02374	-0.05490	-0.43504

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)	0.04804	0.07534	3.12327
	removal	CK (R)	-0.02374	-0.05490	-0.43504
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04818	0.07531	2.98902
	removal	CK (R)	-0.02374	-0.05490	-0.43504

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 ()	0.12747	0.42725	13.33370
	min_pulse_width	SN ()	0.13392	0.42725	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.12747	0.42725	13.33370
	min_pulse_width	SN ()	0.12424	0.42725	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 ()	0.10168	0.42725	13.33370
	min_pulse_width	CK ()	0.18227	0.42725	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.09523	0.42725	13.33370
	min_pulse_width	CK ()	0.17904	0.42725	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 ()	0.24674	0.42725	13.33370
	min_pulse_width	CK ()	0.15326	0.42725	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.24674	0.42725	13.33370
	min_pulse_width	CK ()	0.15326	0.42725	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	0.00682	0.00558	0.00038
	SN	-0.00089	-0.05264	-0.80059
	SN	0.01464	0.01366	0.01199
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00613	0.00519	0.00700
	SN	-0.00089	-0.04296	-0.57057
	SN	0.01394	0.01330	0.01871

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	0.00767	0.00659	-0.00038
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00697	0.00620	0.00536

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	0.00766	0.00658	-0.00026
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00697	0.00620	0.00525

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	0.00679	0.00555	0.00026
	SN	-0.00089	-0.05269	-0.80195
	SN	0.01461	0.01363	0.01176
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00610	0.00517	0.00663
	SN	-0.00089	-0.04305	-0.57273
	SN	0.01391	0.01327	0.01839

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	-0.00194	-0.00198	-0.00199
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00827	0.00783	0.01442
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00335	0.00300	0.00927
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00194	-0.00198	-0.00199
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00827	0.00783	0.01442
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00335	0.00300	0.00927

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	0.00202	0.00201	0.00200
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01267	0.01237	0.01875
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00638	0.00620	0.01260
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00202	0.00201	0.00200
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01267	0.01237	0.01875
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00638	0.00621	0.01260

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)	-0.00368	-0.00370	-0.00369
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00243	0.00210	0.01455
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)	-0.00368	-0.00370	-0.00369
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00243	0.00211	0.01456

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)	0.00370	0.00372	0.00370
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00805	0.00808	0.02221
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)	0.00370	0.00372	0.00370
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00805	0.00808	0.02221

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)	-0.00048	-0.00096	0.01007
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00045	-0.00086	0.01012
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00224	0.00168	0.02299
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00048	-0.00096	0.01007
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00045	-0.00086	0.01011
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00224	0.00168	0.02299

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)	0.02112	0.02062	0.03351
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01040	0.01039	0.02219
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02046	0.02019	0.04118
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01118	0.01113	0.02263
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01345	0.01347	0.03600
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02112	0.02063	0.03351
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01040	0.01040	0.02219
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02046	0.02019	0.04119
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01119	0.01113	0.02264
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01345	0.01347	0.03600

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.00286	0.00849	1.02736
sky130_osu_sc_12T_ms__dff_l	0.00286	0.00848	0.75498

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.06169	0.07541
sky130_osu_sc_12T_ms__dff_l	0.00000	0.33612	0.34984

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)	0.20638	0.77713	6.90629
sky130_osu_sc_12T_ms__dff_l	CK->Q (RR)	0.20508	0.82984	6.85687

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)	0.30554	0.72027	4.57728
sky130_osu_sc_12T_ms__dff_l	CK->Q (RF)	0.30514	0.75949	4.63506

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)	-0.04755	-0.06698	-0.19419
	setup	CK (R)	0.14227	0.17813	1.12957
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.04691	-0.06698	-0.19405
	setup	CK (R)	0.14271	0.17820	1.14681

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)	-0.12609	-0.35321	-3.17106
	setup	CK (R)	0.15320	0.36501	3.27449
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.12429	-0.35321	-3.16404
	setup	CK (R)	0.15321	0.36501	3.27449

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 ()	0.09201	0.42725	13.33370
	min_pulse_width	CK ()	0.16615	0.42725	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.08879	0.42725	13.33370
	min_pulse_width	CK ()	0.16293	0.42725	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 ()**	0.21450	0.42725	13.33370
	min_pulse_width	**CK ()**	0.12102	0.42725	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.21450	0.42725	13.33370
	min_pulse_width	**CK ()**	0.12102	0.42725	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	0.01435	0.01333	0.03188
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01293	0.01193	0.03047

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	0.01563	0.01487	0.02599
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01424	0.01351	0.02467

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	-0.00161	-0.00192	-0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.00751	0.00707	0.01338
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00161	-0.00192	-0.00194
	!CK	0.00000	0.00000	0.00000
	!CK	0.00751	0.00707	0.01338

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	0.00192	0.00194	0.00193
	!CK	0.00000	0.00000	0.00000
	!CK	0.01309	0.01280	0.01924
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00192	0.00195	0.00194
	!CK	0.00000	0.00000	0.00000
	!CK	0.01310	0.01280	0.01925

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)	-0.00051	-0.00099	0.01006
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00046	-0.00086	0.01012
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00051	-0.00099	0.01006
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00046	-0.00086	0.01012

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)	0.01037	0.01038	0.02217
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02035	0.01988	0.03289
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02075	0.02055	0.04169
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01111	0.01105	0.02257
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01037	0.01038	0.02217
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02035	0.01988	0.03289
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02075	0.02055	0.04169
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01111	0.01105	0.02257

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.00277	1.03323
sky130_osu_sc_12T_ms__inv_10	0.02472	10.34597
sky130_osu_sc_12T_ms__inv_2	0.00514	2.12547
sky130_osu_sc_12T_ms__inv_3	0.00760	3.10759
sky130_osu_sc_12T_ms__inv_4	0.01001	4.20263
sky130_osu_sc_12T_ms__inv_6	0.01498	6.26995
sky130_osu_sc_12T_ms__inv_8	0.01985	8.30007
sky130_osu_sc_12T_ms__inv_l	0.00219	0.72068

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00936	0.01841
sky130_osu_sc_12T_ms__inv_10	0.00000	0.09359	0.18411
sky130_osu_sc_12T_ms__inv_2	0.00000	0.01872	0.03682
sky130_osu_sc_12T_ms__inv_3	0.00000	0.02808	0.05523
sky130_osu_sc_12T_ms__inv_4	0.00000	0.03744	0.07364
sky130_osu_sc_12T_ms__inv_6	0.00000	0.05615	0.11046
sky130_osu_sc_12T_ms__inv_8	0.00000	0.07487	0.14729
sky130_osu_sc_12T_ms__inv_l	0.00000	0.14657	0.29300

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)**	0.02967	0.75731	11.18320
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.03301	0.49331	11.16140
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.02172	0.63860	11.11210
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.02318	0.59368	11.11550
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.02274	0.56113	11.10060
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02507	0.52588	11.11130
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02872	0.50588	11.10420
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.03331	0.78171	10.55930

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)**	0.02155	0.54792	8.14608
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.02695	0.36242	8.41321
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01696	0.47987	8.29030
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01818	0.44747	8.35281
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01779	0.42351	8.38422
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02073	0.39248	8.41594
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02375	0.37381	8.41389
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02430	0.57447	7.90847

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	0.00340	0.00355	0.00279
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02755	0.03023	0.02250
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00580	0.00615	0.00762
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00893	0.00938	0.01168
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01135	0.01217	0.01498
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01679	0.01883	0.02269
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02219	0.02429	0.03002
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00266	0.00286	0.00581

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	-0.00057	-0.00053	0.00019
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01028	-0.00926	-0.00057
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00191	-0.00174	-0.00024
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00250	-0.00227	0.00007
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00393	-0.00364	-0.00037
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00598	-0.00490	-0.00050
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00814	-0.00718	-0.00060
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00037	0.00027

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.21129	0.21124	0.00571	0.21092

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.01907	0.01960

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)	-	0.01372	0.27743	2.92087
	A1->Y (RR)	-	0.01616	0.28066	2.92456
	S0->Y (RR)	(!A0 * A1)	0.04808	0.29498	1.28655
	S0->Y (FR)	(A0 * !A1)	0.03190	0.39464	3.33656

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)	-	0.01548	0.26849	2.76270
	A1->Y (FF)	-	0.01374	0.26552	2.76348
	S0->Y (FF)	(!A0 * A1)	0.06520	0.36172	2.15880
	S0->Y (RF)	(A0 * !A1)	0.02364	0.30199	2.37781

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	-	-0.00331	-0.00332	-0.00332
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00215	-0.00215	-0.00215
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00450	0.00479	0.01724
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00211	-0.00238	0.00948

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	-	0.00331	0.00332	0.00332
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00215	0.00216	0.00215
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00057	0.00037	0.01250
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00912	0.00932	0.02137

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)	-0.00080	-0.00080	-0.00080

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)	0.00080	0.00080	0.00080

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)	-0.00095	-0.00095	-0.00095

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)	0.00095	0.00095	0.00095

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)	-0.00079	-0.00091	0.01103
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00076	-0.00104	0.01105

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)	0.00707	0.00717	0.01940
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00654	0.00672	0.01918

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00276	0.00275	1.02581
sky130_osu_sc_12T_ms__nand2_l	0.00214	0.00216	0.71855

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00937	0.03682
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.14659	0.58600

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)	0.03092	0.75908	11.17290
	B->Y (FR)	0.03523	0.73169	10.72150
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.03359	0.78221	10.55930
	B->Y (FR)	0.04027	0.78766	10.54430

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)	0.03219	0.70005	10.27140
	B->Y (RF)	0.03661	0.68642	9.89410
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.03581	0.74100	9.96635
	B->Y (RF)	0.04000	0.72955	9.53642

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	0.00359	0.00373	0.00282
	B	0.00000	0.00000	0.00000
	B	0.00457	0.00463	0.00594
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00269	0.00289	0.00545
	B	0.00000	0.00000	0.00000
	B	0.00338	0.00354	0.00613

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	-0.00037	-0.00035	0.00029
	B	0.00000	0.00000	0.00000
	B	-0.00035	-0.00043	0.00006
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00023	-0.00022	0.00036
	B	0.00000	0.00000	0.00000
	B	-0.00022	-0.00027	0.00016

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)	-0.00226	-0.00227	-0.00228
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00161	-0.00161	-0.00161

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)	0.00228	0.00231	0.00229
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00161	0.00163	0.00162

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)	-0.00210	-0.00211	-0.00210
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00151	-0.00151	-0.00151

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)	0.00213	0.00212	0.00211
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00152	0.00152	0.00151

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00272	0.00299	0.55210
sky130_osu_sc_12T_ms__nor2_l	0.00205	0.00227	0.39843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00729	0.01841
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.09787	0.29299

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)	0.06644	0.90395	10.84220
	B->Y (FR)	0.05302	0.89338	11.00300
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.06938	0.95054	10.40830
	B->Y (FR)	0.05878	0.92480	10.39590

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)	0.02842	0.46350	5.85538
	B->Y (RF)	0.02294	0.45438	5.84036
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.03008	0.48477	5.75084
	B->Y (RF)	0.02543	0.47935	5.73736

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	0.00472	0.00464	0.00551
	B	0.00000	0.00000	0.00000
	B	0.00373	0.00379	0.00572
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00342	0.00336	0.00480
	B	0.00000	0.00000	0.00000
	B	0.00279	0.00281	0.00669

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	0.00053	0.00037	0.00146
	B	0.00000	0.00000	0.00000
	B	-0.00044	-0.00038	0.00063
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00038	0.00036	0.00129
	B	0.00000	0.00000	0.00000
	B	-0.00027	-0.00022	0.00069

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)	-0.00162	-0.00194	-0.00195
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00105	-0.00131	-0.00133

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)	0.00194	0.00195	0.00195
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00133	0.00134	0.00134

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)	-0.00093	-0.00094	-0.00093
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00065	-0.00066	-0.00065

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)	0.00098	0.00099	0.00095
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00069	0.00069	0.00066

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00275	0.00285	0.00243	0.54663

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.11363	0.31141

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)	0.07516	0.91449	10.98870
	A1->Y (FR)	0.09174	0.92868	10.82570
	B0->Y (FR)	0.04147	0.71103	9.02750

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)	0.04436	0.56469	6.83146
	A1->Y (RF)	0.05265	0.56194	6.73167
	B0->Y (RF)	0.03466	0.58646	7.45080

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	0.00515	0.00517	0.00687
	A1	0.00000	0.00000	0.00000
	A1	0.00620	0.00602	0.00689
	B0	0.00415	0.00436	0.00806

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	0.00016	0.00083
	A1	0.00000	0.00000	0.00000
	A1	0.00122	0.00102	0.00170
	B0	0.00052	0.00052	0.00143

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)	-0.00093	-0.00094	-0.00093
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00195	-0.00198	-0.00198
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00201	-0.00203	-0.00202

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)	0.00099	0.00099	0.00095
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00197	0.00198	0.00198
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00203	0.00204	0.00202

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)	-0.00155	-0.00188	-0.00189
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00193	-0.00197	-0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00199	-0.00199	-0.00199

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)	0.00187	0.00190	0.00189
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00195	0.00197	0.00196
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00199	0.00199	0.00200

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)	-0.00168	-0.00169	-0.00172

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)	0.00173	0.00176	0.00173

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00259	0.00271	0.00290	0.00286	0.56936

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.01093	0.03682

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)	0.09730	0.92327	10.79900
	A1->Y (FR)	0.08418	0.91291	10.98380
	B0->Y (FR)	0.05625	0.88466	10.96240
	B1->Y (FR)	0.07073	0.89621	10.77970

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)	0.07098	0.60623	7.05436
	A1->Y (RF)	0.05800	0.58887	7.01197
	B0->Y (RF)	0.04905	0.61101	7.63496
	B1->Y (RF)	0.06270	0.62741	7.69849

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	0.00789	0.00778	0.00856
	A1	0.00684	0.00686	0.00852
	B0	0.00496	0.00504	0.00668
	B1	0.00608	0.00597	0.00675

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00185	0.00167	0.00230
	A1	0.00097	0.00087	0.00149
	B0	-0.00015	-0.00013	0.00082
	B1	0.00186	0.00172	0.00259

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)	-0.00159	-0.00191	-0.00191
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00159	-0.00191	-0.00191
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00187	-0.00191	-0.00190
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00193	-0.00193	-0.00193

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)	0.00190	0.00192	0.00191
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00190	0.00192	0.00191
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00189	0.00191	0.00190
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00193	0.00195	0.00194

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)	-0.00091	-0.00092	-0.00091
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00091	-0.00092	-0.00091
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00187	-0.00189	-0.00189
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00192	-0.00193	-0.00193

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)	0.00096	0.00096	0.00092
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00096	0.00096	0.00092
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00188	0.00189	0.00189
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00192	0.00195	0.00193

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)	-0.00092	-0.00093	-0.00092
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00091	-0.00093	-0.00092
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00220	-0.00224	-0.00223
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00220	-0.00222	-0.00226

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)	0.00097	0.00098	0.00093
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00097	0.00098	0.00093
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00223	0.00225	0.00223
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00227	0.00231	0.00227

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)	-0.00157	-0.00190	-0.00190
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00157	-0.00190	-0.00190
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00224	-0.00230	-0.00228
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00225	-0.00225	-0.00230

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)	0.00189	0.00190	0.00190
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00189	0.00191	0.00190
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00228	0.00230	0.00228
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00230	0.00233	0.00231

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00307	0.00284	1.05930
sky130_osu_sc_12T_ms__or2_2	0.00307	0.00284	2.18241
sky130_osu_sc_12T_ms__or2_4	0.00308	0.00284	4.30316
sky130_osu_sc_12T_ms__or2_8	0.00308	0.00284	8.41854
sky130_osu_sc_12T_ms__or2_l	0.00231	0.00216	0.75704

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.01212	0.01903
sky130_osu_sc_12T_ms__or2_2	0.00000	0.01695	0.03744
sky130_osu_sc_12T_ms__or2_4	0.00000	0.02662	0.07426
sky130_osu_sc_12T_ms__or2_8	0.00000	0.04595	0.14790
sky130_osu_sc_12T_ms__or2_l	0.00000	0.17123	0.29329

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)	0.07125	0.65094	6.88027
	B->Y (RR)	0.06278	0.62187	6.78792
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.07587	0.56639	6.95296
	B->Y (RR)	0.06701	0.54221	6.86597
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.09811	0.54929	7.21547
	B->Y (RR)	0.08907	0.53019	7.14511
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.14148	0.58660	7.63964
	B->Y (RR)	0.13231	0.57286	7.57212
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.07445	0.70109	6.78632
	B->Y (RR)	0.06663	0.67505	6.77280

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)	0.12726	0.63782	5.86552
	B->Y (FF)	0.10723	0.61346	5.80604
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.15192	0.63314	6.24873
	B->Y (FF)	0.13222	0.61872	6.17096
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.21479	0.69155	6.69978
	B->Y (FF)	0.19520	0.68325	6.62000
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.34218	0.83188	7.24948
	B->Y (FF)	0.32259	0.81811	7.19860
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.13225	0.65819	5.64796
	B->Y (FF)	0.11422	0.63160	5.58515

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	0.00367	0.00329	0.00937
	B	0.00000	0.00000	0.00000
	B	0.00275	0.00264	0.01153
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00605	0.00588	0.01212
	B	0.00000	0.00000	0.00000
	B	0.00508	0.00523	0.01253
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01149	0.01173	0.01847
	B	0.00000	0.00000	0.00000
	B	0.01047	0.01112	0.01866
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02247	0.02326	0.03151
	B	0.00000	0.00000	0.00000
	B	0.02145	0.02284	0.03140
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00280	0.00260	0.00903
	B	0.00000	0.00000	0.00000
	B	0.00216	0.00218	0.01320

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	0.00800	0.00771	0.01326
	B	0.00000	0.00000	0.00000
	B	0.00670	0.00708	0.01700
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00980	0.00983	0.01519
	B	0.00000	0.00000	0.00000
	B	0.00852	0.00913	0.01851
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01440	0.01475	0.01986
	B	0.00000	0.00000	0.00000
	B	0.01319	0.01391	0.02278
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02531	0.02460	0.02965
	B	0.00000	0.00000	0.00000
	B	0.02400	0.02403	0.03216
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00595	0.00581	0.01282
	B	0.00000	0.00000	0.00000
	B	0.00505	0.00555	0.01874

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)	-0.00164	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00164	-0.00196	-0.00197
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00164	-0.00197	-0.00197
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00164	-0.00197	-0.00197
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00105	-0.00133	-0.00134

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)	0.00196	0.00197	0.00197
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00196	0.00197	0.00197
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00196	0.00197	0.00197
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00196	0.00198	0.00197
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00134	0.00135	0.00135

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)	-0.00093	-0.00094	-0.00094
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00094
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00094
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00094
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00064	-0.00064	-0.00064

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)	0.00098	0.00100	0.00095
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00099	0.00100	0.00095
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00098	0.00100	0.00095
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00099	0.00100	0.00095
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00067	0.00068	0.00065

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00296	0.00389	0.57265
sky130_osu_sc_12T_ms__tbufi_l	0.00228	0.00298	0.39747

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00957	0.03682
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.14669	0.58599

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)	0.04878	0.88073	10.99330
	OE->Y (FR)	0.04691	0.31063	4.86174
	OE->Y (RR)	0.08236	0.74852	6.86842
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.05648	0.92240	10.37560
	OE->Y (FR)	0.04706	0.31055	4.86170
	OE->Y (RR)	0.08804	0.81966	6.84204

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)	0.03153	0.57001	7.33060
	OE->Y (FF)	0.04811	0.31062	4.86175
	OE->Y (RF)	0.02999	0.54670	6.89181
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.03552	0.59806	7.07952
	OE->Y (FF)	0.04790	0.31054	4.86171
	OE->Y (RF)	0.03320	0.57324	6.59740

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	0.00347	0.00352	0.00526
	OE	0.00000	0.00000	0.00000
	OE	0.00335	0.00322	0.01389
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00263	0.00263	0.00606
	OE	0.00000	0.00000	0.00000
	OE	0.00245	0.00247	0.01722

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	-0.00045	-0.00041	0.00050
	OE	0.00000	0.00000	0.00000
	OE	0.00208	0.00191	0.01431
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00026	-0.00023	0.00058
	OE	0.00000	0.00000	0.00000
	OE	0.00148	0.00150	0.01758

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)	-0.00162	-0.00163	-0.00162
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00144	-0.00147	-0.00144
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00117	-0.00118	-0.00117
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00104	-0.00106	-0.00105

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)	0.00162	0.00163	0.00162
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00148	0.00149	0.00146
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00117	0.00118	0.00117
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00107	0.00107	0.00105

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)	0.00123	0.00108	0.01359
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00109	0.00095	0.01344
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00088	0.00093	0.01715
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00074	0.00081	0.01698

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)	0.00417	0.00429	0.01681
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00422	0.00437	0.01689
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00318	0.00360	0.02004
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00318	0.00366	0.02008

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00296	0.00438	0.57269
sky130_osu_sc_12T_ms__tnbufi_l	0.00218	0.00332	0.39815

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.01561	0.01872
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.24431	0.29317

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)	0.04921	0.88065	10.99330
	OE->Y (RR)	0.02736	0.31078	4.86196
	OE->Y (FR)	0.05917	0.88723	10.80760
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.05546	0.92497	10.38380
	OE->Y (RR)	0.02980	0.31055	4.86175
	OE->Y (FR)	0.06375	0.94529	10.38050

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)	0.03085	0.56953	7.33065
	OE->Y (RF)	0.02719	0.31078	4.86196
	OE->Y (FF)	0.05860	0.52151	4.77034
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.03386	0.59815	7.08518
	OE->Y (RF)	0.02961	0.31055	4.86180
	OE->Y (FF)	0.06363	0.53794	4.43598

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	0.00360	0.00365	0.00538
	OE	0.00000	0.00000	0.00000
	OE	0.00855	0.00886	0.02197
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00269	0.00281	0.00612
	OE	0.00000	0.00000	0.00000
	OE	0.00646	0.00710	0.02383

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	-0.00062	-0.00056	0.00034
	OE	0.00000	0.00000	0.00000
	OE	0.00741	0.00790	0.01946
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00044	-0.00039	0.00041
	OE	0.00000	0.00000	0.00000
	OE	0.00562	0.00645	0.02196

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)	-0.00133	-0.00134	-0.00133
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00117	-0.00119	-0.00117
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00091	-0.00092	-0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00079	-0.00081	-0.00080

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)	0.00133	0.00134	0.00133
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00120	0.00120	0.00118
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00091	0.00092	0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00083	0.00083	0.00081

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)	-0.00213	-0.00255	0.01022
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00213	-0.00245	0.01024
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00141	-0.00158	0.01478
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00148	-0.00159	0.01478

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)	0.00641	0.00683	0.01983
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00631	0.00685	0.01973
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00492	0.00571	0.02227
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00486	0.00555	0.02221

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00593	0.00505	0.60131

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.03279	0.05554

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	0.10526	0.79501	7.18325
	A->Y (FR)	!B	0.06578	0.90661	11.22580
	B->Y (RR)	A	0.08632	0.77683	7.18997
	B->Y (FR)	!A	0.08119	0.91564	11.04510

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	0.09746	0.60776	5.17131
	A->Y (RF)	!B	0.04311	0.56726	7.10891
	B->Y (FF)	A	0.08555	0.59629	5.16640
	B->Y (RF)	!A	0.05220	0.57917	7.11744

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	0.00357	0.00331	0.01417
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00881	0.00898	0.02339
	B	A	0.00000	0.00000	0.00000
	B	A	0.00160	0.00159	0.01386
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00927	0.00939	0.02270

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	0.01033	0.01021	0.02242
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00230	0.00202	0.01479
	B	A	0.00000	0.00000	0.00000
	B	A	0.00932	0.00968	0.02223
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00304	0.00271	0.01548

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00596	0.00509	0.56096

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.03279	0.05508

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	0.11083	0.80206	7.12119
	A->Y (FR)	B	0.08333	0.92421	10.98380
	B->Y (RR)	!A	0.09127	0.79157	7.12012
	B->Y (FR)	A	0.09141	0.93387	10.98360

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	0.09396	0.59430	4.89116
	A->Y (RF)	B	0.04457	0.58525	7.26403
	B->Y (FF)	!A	0.08870	0.59009	4.93107
	B->Y (RF)	A	0.05072	0.56597	6.83426

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	0.01017	0.01019	0.02334
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00224	0.00149	0.01328
	B	A	0.00000	0.00000	0.00000
	B	A	0.01031	0.01043	0.02346
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00154	0.00143	0.01351

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	0.00197	0.00151	0.01441
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01075	0.01097	0.02212
	B	A	0.00000	0.00000	0.00000
	B	A	0.00200	0.00160	0.01408
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00944	0.00985	0.02221

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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	0.32102
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	135643.00000	271287.00000
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
	-0.00143	0.02926	0.46121

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
	2.36152	2.25103	0.56575