sky130_osu_sc_12T_ms_ss_1P60_150C.ccs Library

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

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.01157	0.01161	0.00888	0.86875	0.38909	0.79789
sky130_osu_sc_12T_ms__addf_l	0.01158	0.01161	0.00888	0.62407	0.39021	0.79728

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	1.34252	1.48562
sky130_osu_sc_12T_ms__addf_l	0.00000	2.58839	3.93204

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)	0.29918	2.56880	30.67820
	B->CO (RR)	0.30657	2.56643	30.57810
	CI->CO (RR)	0.28210	2.59616	31.29500
	CON->CO (FR)	0.03862	0.84224	10.93120
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.29329	2.36133	25.01350
	B->CO (RR)	0.30090	2.36756	25.12190
	CI->CO (RR)	0.27647	2.38842	25.64840
	CON->CO (FR)	0.04325	0.89215	10.64300

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)	0.35940	2.93558	34.74820
	B->CO (FF)	0.33212	2.84510	33.76010
	CI->CO (FF)	0.32100	2.91871	35.17170
	CON->CO (RF)	0.03905	0.82288	10.67710
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.36184	2.76670	28.89850
	B->CO (FF)	0.33775	2.69003	28.14870
	CI->CO (FF)	0.32355	2.74991	29.34640
	CON->CO (RF)	0.04629	0.92760	11.11700

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)	0.24395	1.14371	9.86456
	B->CON (FR)	0.21426	1.09127	9.89949
	CI->CON (FR)	0.20569	1.13069	10.34510
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.23139	1.13375	9.87133
	B->CON (FR)	0.20261	1.08087	9.90573
	CI->CON (FR)	0.19310	1.11949	10.35180

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)	0.20909	1.01579	9.08558
	B->CON (RF)	0.21671	1.04510	9.56014
	CI->CON (RF)	0.19213	1.04390	9.75121
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.20124	1.00890	9.09357
	B->CON (RF)	0.20890	1.03986	9.56776
	CI->CON (RF)	0.18419	1.03711	9.75789

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)	0.52771	2.67604	26.22620
	B->S (-R)	0.57968	2.73613	25.85560
	CI->S (-R)	0.48686	2.65329	26.65430
	CON->S (RR)	0.14937	0.92896	8.40441
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.50767	2.65956	26.19640
	B->S (-R)	0.55909	2.71952	25.82630
	CI->S (-R)	0.46677	2.63688	26.62680
	CON->S (RR)	0.14947	0.92871	8.39893

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)	0.50113	2.37736	21.88380
	B->S (-F)	0.49807	2.31273	21.77120
	CI->S (-F)	0.48343	2.39812	22.50660
	CON->S (FF)	0.18461	0.89767	6.82609
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.48707	2.36685	21.86220
	B->S (-F)	0.48421	2.30296	21.75010
	CI->S (-F)	0.46943	2.38771	22.48580
	CON->S (FF)	0.18468	0.89742	6.82134

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	0.00209	0.00249	0.00930
	B	0.00307	0.00340	0.00982
	CI	0.00310	0.00359	0.01047
sky130_osu_sc_12T_ms__addf_l	A	0.00182	0.00209	0.00676
	B	0.00281	0.00300	0.00736
	CI	0.00283	0.00320	0.00791

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00756	0.00811	0.01699
	B	0.00801	0.00850	0.01632
	CI	0.00637	0.00691	0.01598
sky130_osu_sc_12T_ms__addf_l	A	0.00739	0.00775	0.01361
	B	0.00782	0.00818	0.01324
	CI	0.00619	0.00658	0.01267

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00755	0.00780	0.01180
	B	0.00799	0.00828	0.01171
	CI	0.00705	0.00745	0.01109
sky130_osu_sc_12T_ms__addf_l	A	0.00736	0.00760	0.01129
	B	0.00779	0.00806	0.01122
	CI	0.00685	0.00722	0.01061

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00207	0.00227	0.00547
	B	0.00305	0.00316	0.00620
	CI	0.00308	0.00337	0.00665
sky130_osu_sc_12T_ms__addf_l	A	0.00180	0.00199	0.00508
	B	0.00278	0.00288	0.00581
	CI	0.00282	0.00308	0.00621

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00756	0.00805	0.01616
	B	0.00800	0.00847	0.01562
	CI	0.00637	0.00688	0.01518
sky130_osu_sc_12T_ms__addf_l	A	0.00738	0.00781	0.01531
	B	0.00781	0.00823	0.01483
	CI	0.00619	0.00664	0.01433

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01646	0.01656	0.02358
	B	0.01505	0.01507	0.02331
	CI	0.01349	0.01341	0.02000
sky130_osu_sc_12T_ms__addf_l	A	0.01686	0.01648	0.02285
	B	0.01510	0.01513	0.02337
	CI	0.01355	0.01346	0.02006

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00573	0.00600	0.84522	0.86558	0.87271
sky130_osu_sc_12T_ms__addh_l	0.00573	0.00600	0.62145	0.86662	0.63210

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	1.55294	1.64706
sky130_osu_sc_12T_ms__addh_l	0.00000	4.04489	4.13880

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)	0.19966	0.98674	8.55394
	B->CO (RR)	0.20507	0.96237	8.51792
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.19335	1.02151	8.37831
	B->CO (RR)	0.19895	0.99918	8.34230

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)	0.14778	0.85418	7.06325
	B->CO (FF)	0.15434	0.87359	7.14848
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.15055	0.94547	7.50233
	B->CO (FF)	0.15708	0.96678	7.60803

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)	0.26944	1.02606	8.59809
	B->CON (RR)	0.27327	0.99971	8.56133
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.24830	0.99923	8.54263
	B->CON (RR)	0.25243	0.97430	8.50865

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)	0.20361	0.89828	7.21357
	B->CON (FF)	0.19787	0.90743	7.28720
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.18778	0.86627	7.06054
	B->CON (FF)	0.18241	0.87624	7.13238

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)	0.27545	1.83314	18.90250
	B->S (FR)	0.26908	1.84338	19.02060
	CON->S (FR)	0.04013	0.84847	11.06380
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.26167	1.71155	15.53600
	B->S (FR)	0.25542	1.72065	15.63510
	CON->S (FR)	0.04366	0.89858	10.76010

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)	0.35042	1.99798	20.74060
	B->S (RF)	0.35442	1.97132	20.69740
	CON->S (RF)	0.03850	0.82358	10.72890
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.33718	1.93102	17.89220
	B->S (RF)	0.34128	1.90741	17.84570
	CON->S (RF)	0.04535	0.92835	11.22700

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	0.00381	0.00378	0.00688
	B	0.00000	0.00000	0.00000
	B	0.00344	0.00333	0.00651
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00335	0.00327	0.00634
	B	0.00000	0.00000	0.00000
	B	0.00299	0.00283	0.00590

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	0.00547	0.00542	0.00907
	B	0.00000	0.00000	0.00000
	B	0.00568	0.00585	0.00969
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00500	0.00492	0.00851
	B	0.00000	0.00000	0.00000
	B	0.00521	0.00534	0.00899

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	0.00381	0.00378	0.00688
	B	0.00000	0.00000	0.00000
	B	0.00344	0.00333	0.00651
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00335	0.00327	0.00631
	B	0.00000	0.00000	0.00000
	B	0.00298	0.00281	0.00590

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	0.00547	0.00542	0.00908
	B	0.00000	0.00000	0.00000
	B	0.00568	0.00586	0.00968
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00499	0.00491	0.00853
	B	0.00000	0.00000	0.00000
	B	0.00521	0.00534	0.00906

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	0.00548	0.00543	0.00908
	B	0.00000	0.00000	0.00000
	B	0.00569	0.00587	0.00973
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00501	0.00493	0.00850
	B	0.00000	0.00000	0.00000
	B	0.00523	0.00535	0.00899

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	0.00381	0.00378	0.00696
	B	0.00000	0.00000	0.00000
	B	0.00345	0.00333	0.00664
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00336	0.00328	0.00639
	B	0.00000	0.00000	0.00000
	B	0.00299	0.00283	0.00593

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.72920	0.69338	0.23990
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.72934	0.69354	0.24005

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.72922	0.69400	0.25663
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.72936	0.69414	0.25677

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00304	0.00315	0.85032
sky130_osu_sc_12T_ms__and2_2	0.00304	0.00315	1.68503
sky130_osu_sc_12T_ms__and2_4	0.00304	0.00315	3.30771
sky130_osu_sc_12T_ms__and2_6	0.00307	0.00315	4.91870
sky130_osu_sc_12T_ms__and2_8	0.00304	0.00315	6.45339
sky130_osu_sc_12T_ms__and2_l	0.00226	0.00233	0.62394

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.63952	0.83896
sky130_osu_sc_12T_ms__and2_2	0.00000	0.84587	0.87849
sky130_osu_sc_12T_ms__and2_4	0.00000	1.43487	1.64260
sky130_osu_sc_12T_ms__and2_6	0.00000	2.02386	2.40671
sky130_osu_sc_12T_ms__and2_8	0.00000	2.61286	3.17082
sky130_osu_sc_12T_ms__and2_l	0.00000	3.76995	5.89242

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)	0.15133	0.89389	8.34417
	B->Y (RR)	0.16080	0.88011	8.24197
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.17295	0.84154	8.47846
	B->Y (RR)	0.18248	0.82032	8.38069
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.23666	0.88530	8.88860
	B->Y (RR)	0.24618	0.85491	8.73509
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.30153	0.95402	9.22714
	B->Y (RR)	0.31075	0.92163	9.04070
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.36382	1.02291	9.49292
	B->Y (RR)	0.37332	0.99307	9.28127
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.15859	0.97088	8.58729
	B->Y (RR)	0.16818	0.95743	8.46851

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)	0.11651	0.75649	6.53036
	B->Y (FF)	0.11994	0.77431	6.59959
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.13250	0.71763	6.73335
	B->Y (FF)	0.13566	0.72928	6.79893
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.18468	0.75631	7.16400
	B->Y (FF)	0.18543	0.76025	7.22932
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.23972	0.81619	7.52062
	B->Y (FF)	0.23780	0.81521	7.56996
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.29178	0.87214	7.73727
	B->Y (FF)	0.28762	0.86741	7.78249
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.11944	0.83486	6.66700
	B->Y (FF)	0.12619	0.85619	6.73890

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	0.00272	0.00278	0.01352
	B	0.00000	0.00000	0.00000
	B	0.00277	0.00249	0.01064
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00517	0.00538	0.01542
	B	0.00000	0.00000	0.00000
	B	0.00523	0.00513	0.01500
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01102	0.01112	0.02084
	B	0.00000	0.00000	0.00000
	B	0.01108	0.01104	0.01838
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01739	0.01729	0.02661
	B	0.00000	0.00000	0.00000
	B	0.01745	0.01699	0.02461
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02423	0.02263	0.03214
	B	0.00000	0.00000	0.00000
	B	0.02429	0.02296	0.03077
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00222	0.00218	0.01100
	B	0.00000	0.00000	0.00000
	B	0.00225	0.00204	0.00907

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	0.00670	0.00714	0.01769
	B	0.00000	0.00000	0.00000
	B	0.00756	0.00788	0.01804
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00831	0.00910	0.01945
	B	0.00000	0.00000	0.00000
	B	0.00921	0.00983	0.01988
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01259	0.01387	0.02402
	B	0.00000	0.00000	0.00000
	B	0.01348	0.01451	0.02443
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01727	0.01871	0.02904
	B	0.00000	0.00000	0.00000
	B	0.01812	0.01927	0.02923
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02217	0.02331	0.03372
	B	0.00000	0.00000	0.00000
	B	0.02300	0.02379	0.03381
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00502	0.00540	0.01470
	B	0.00000	0.00000	0.00000
	B	0.00561	0.00594	0.01498

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	-0.00238	-0.00239
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00236	-0.00237	-0.00239
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00235	-0.00237	-0.00238
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00236	-0.00238	-0.00240
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00234	-0.00235	-0.00237
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00161	-0.00162

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)	0.00241	0.00241	0.00241
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00240	0.00240	0.00241
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00241	0.00245	0.00242
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00244	0.00248	0.00245
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00242	0.00246	0.00243
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00169	0.00168	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)	-0.00228	-0.00229	-0.00228
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00228	-0.00229	-0.00228
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00227	-0.00228	-0.00227
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00227	-0.00227	-0.00226
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00226	-0.00227	-0.00226
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00155	-0.00156	-0.00156

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)	0.00232	0.00233	0.00230
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00233	0.00230
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00234	0.00234	0.00231
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00234	0.00234	0.00231
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00235	0.00235	0.00232
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00164	0.00164	0.00162

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00280	0.00298	0.00292	0.37512

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.33979	0.72444

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)	0.12647	1.03458	9.68605
	A1->Y (FR)	0.10487	0.96586	9.28826
	B0->Y (FR)	0.09535	1.02958	10.24690

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)	0.11318	0.89631	8.66699
	A1->Y (RF)	0.10638	0.92560	9.26568
	B0->Y (RF)	0.05696	0.78814	8.55434

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	0.00577	0.00572	0.00713
	A1	0.00000	0.00000	0.00000
	A1	0.00493	0.00488	0.00629
	B0	0.00458	0.00461	0.00605

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	0.00137	0.00115	0.00238
	A1	0.00000	0.00000	0.00000
	A1	0.00139	0.00121	0.00268
	B0	-0.00047	-0.00053	0.00051

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)	-0.00164	-0.00198	-0.00200
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00202	-0.00203	-0.00202
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00202	-0.00203	-0.00202

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)	0.00199	0.00199	0.00200
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00202	0.00204	0.00203
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00205	0.00205	0.00203

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)	-0.00165	-0.00196	-0.00200
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00203	-0.00203	-0.00202
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00219	-0.00220	-0.00221

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)	0.00199	0.00200	0.00200
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00204	0.00207	0.00204
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00221	0.00222	0.00222

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)	-0.00090	-0.00090	-0.00090

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)	0.00099	0.00099	0.00093

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__aoi22_1	0.00280	0.00297	0.00310	0.00292	0.36875

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.36173	0.78001

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)	0.15955	1.07018	9.63915
	A1->Y (FR)	0.14339	1.04937	9.59353
	B0->Y (FR)	0.10018	1.03074	10.15880
	B1->Y (FR)	0.11682	1.05076	10.21710

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)	0.15202	0.93111	8.62110
	A1->Y (RF)	0.14497	0.96081	9.22137
	B0->Y (RF)	0.07518	0.88469	9.14604
	B1->Y (RF)	0.08316	0.85543	8.54801

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	0.00706	0.00700	0.00845
	A1	0.00623	0.00615	0.00752
	B0	0.00490	0.00491	0.00703
	B1	0.00575	0.00579	0.00791

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00269	0.00247	0.00374
	A1	0.00271	0.00251	0.00403
	B0	-0.00029	-0.00032	0.00122
	B1	-0.00025	-0.00035	0.00094

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)	-0.00161	-0.00197	-0.00200
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00201	-0.00203	-0.00202
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00202	-0.00202	-0.00202
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00202	-0.00203	-0.00202

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)	0.00198	0.00200	0.00200
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00203	0.00204	0.00204
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00205	0.00205	0.00203
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00205	0.00205	0.00203

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)	-0.00161	-0.00197	-0.00200
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00203	-0.00203	-0.00202
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00218	-0.00219	-0.00220
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00218	-0.00219	-0.00220

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)	0.00199	0.00200	0.00200
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00204	0.00205	0.00204
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00220	0.00221	0.00221
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00220	0.00221	0.00221

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)	-0.00089	-0.00090	-0.00090
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00087	-0.00087	-0.00088
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00227	-0.00227	-0.00229
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00227	-0.00227	-0.00229

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)	0.00103	0.00104	0.00093
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00090	0.00090	0.00090
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00229	0.00231	0.00230
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00229	0.00231	0.00230

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)	-0.00090	-0.00091	-0.00091
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00088	-0.00089	-0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00212	-0.00213	-0.00212
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00212	-0.00213	-0.00212

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)	0.00104	0.00104	0.00094
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00091	0.00091	0.00091
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00215	0.00214	0.00213
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00215	0.00214	0.00213

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00316	0.80708
sky130_osu_sc_12T_ms__buf_2	0.00316	1.66642
sky130_osu_sc_12T_ms__buf_4	0.00315	3.29815
sky130_osu_sc_12T_ms__buf_6	0.00084	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00316	6.46431
sky130_osu_sc_12T_ms__buf_l	0.00230	0.62564

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.56011	0.56011
sky130_osu_sc_12T_ms__buf_2	0.00000	0.69394	0.83896
sky130_osu_sc_12T_ms__buf_4	0.00000	1.10784	1.60307
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	1.93562	3.13129
sky130_osu_sc_12T_ms__buf_l	0.00000	3.05185	3.05188

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)**	0.10156	0.82972	7.99696
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.10928	0.75256	8.19446
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.14470	0.75445	8.52298
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.21463	0.82820	9.00681
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.10799	0.90048	8.28903

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)**	0.11066	0.73112	6.24569
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.12707	0.70558	6.69776
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.17929	0.74756	7.17823
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.28596	0.86471	7.76648
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.11648	0.82934	6.72039

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	0.00261	0.00260	0.01150
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00500	0.00516	0.01395
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01054	0.01097	0.01965
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02231	0.02272	0.03179
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00207	0.00201	0.01049

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	0.00654	0.00690	0.01758
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00813	0.00873	0.01918
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01238	0.01340	0.02360
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02198	0.02271	0.03300
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00499	0.00540	0.01515

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
	-0.00055	-0.00055	-0.00052

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
	0.00055	0.00055	0.00052

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00292	0.00291	0.00934	0.84740	0.84921
sky130_osu_sc_12T_ms__dffnr_l	0.00292	0.00291	0.00934	0.63252	0.62842

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	3.60899	6.23400
sky130_osu_sc_12T_ms__dffnr_l	0.00000	6.10075	8.72577

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)	0.66478	2.20352	18.32110
	QN->Q (FR)	0.04287	0.90376	11.66940
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.66544	2.38923	18.82050
	QN->Q (FR)	0.04568	0.94235	11.27770

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)	0.43509	1.99387	19.24010
	QN->Q (RF)	0.04138	0.85974	11.08560
	RN->Q (FF)	0.40642	2.00985	19.36520
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.44003	2.23446	20.14220
	QN->Q (RF)	0.04769	0.96601	11.61920
	RN->Q (FF)	0.41173	2.25205	20.26400

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)	0.36625	1.06611	7.65125
	RN->QN (FR)	0.33727	1.08203	7.77362
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.35886	1.11084	7.55089
	RN->QN (FR)	0.33014	1.12747	7.67203

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)**	0.59600	1.31251	7.18399
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.59230	1.39526	7.68241

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)	-0.21061	-0.43373	-3.19714
	setup	CK (F)	0.31983	0.45774	3.26538
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.21123	-0.43373	-3.19682
	setup	CK (F)	0.32030	0.45774	3.26536

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)	-0.13289	-0.15471	-0.25537
	setup	CK (F)	0.32118	0.36343	1.19563
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.13502	-0.15404	-0.25426
	setup	CK (F)	0.32371	0.35889	1.20251

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)	-0.21061	-0.43373	-3.19714
	setup	CK (F)	0.31983	0.45774	3.26538
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.21123	-0.43373	-3.19682
	setup	CK (F)	0.32030	0.45774	3.26536

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)	-0.13289	-0.15471	-0.25537
	setup	CK (F)	0.32118	0.36343	1.19563
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.13502	-0.15404	-0.25426
	setup	CK (F)	0.32371	0.35889	1.20251

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)	0.23768	0.29206	1.33430
	removal	CK (F)	-0.17297	-0.24909	-1.30697
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.23865	0.29089	1.33538
	removal	CK (F)	-0.17297	-0.24909	-1.30697

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)	0.23768	0.29206	1.33430
	removal	CK (F)	-0.17297	-0.24909	-1.30697
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.23865	0.29089	1.33538
	removal	CK (F)	-0.17297	-0.24909	-1.30697

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 ()	0.24526	0.52490	13.33370
	min_pulse_width	RN ()	0.24526	0.52490	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.23738	0.52490	13.33370
	min_pulse_width	RN ()	0.24132	0.52490	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 ()	0.29646	0.52490	13.33370
	min_pulse_width	CK ()	0.40280	0.52490	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.29646	0.52490	13.33370
	min_pulse_width	CK ()	0.40280	0.52490	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 ()	0.31615	0.52490	13.33370
	min_pulse_width	CK ()	0.20193	0.52490	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.30434	0.52490	13.33370
	min_pulse_width	CK ()	0.19799	0.52490	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	0.01271	0.01251	0.01367
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01203	0.01191	0.01559

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	0.01270	0.01234	0.01604
	RN	-0.00087	-0.04125	-0.54233
	RN	0.01665	0.01616	0.01508
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01201	0.01182	0.01854
	RN	-0.00087	-0.03461	-0.40481
	RN	0.01595	0.01562	0.01780

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	0.01268	0.01233	0.01580
	RN	-0.00087	-0.04130	-0.54323
	RN	0.01664	0.01614	0.01507
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01197	0.01178	0.01844
	RN	-0.00087	-0.03448	-0.40200
	RN	0.01593	0.01559	0.01774

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	0.01269	0.01248	0.01364
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01199	0.01187	0.01538

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)	0.00810	0.00774	0.01526
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00281	0.00249	0.01008
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00180	-0.00214	-0.00219
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)	0.00813	0.00776	0.01528
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00283	0.00252	0.01010
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00177	-0.00212	-0.00217

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)	0.01307	0.01290	0.02097
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00699	0.00686	0.01477
	!CK	0.00000	0.00000	0.00000
	!CK	0.00223	0.00225	0.00224
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)	0.01309	0.01292	0.02100
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00701	0.00688	0.01479
	!CK	0.00000	0.00000	0.00000
	!CK	0.00225	0.00227	0.00226

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)	0.00801	0.00779	0.01909
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00257	0.00249	0.01348
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00803	0.00782	0.01911
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00259	0.00251	0.01350

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)	0.01272	0.01273	0.02408
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00653	0.00674	0.01824
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01274	0.01275	0.02410
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00656	0.00676	0.01826

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)	-0.00036	-0.00076	0.01021
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00859	0.00779	0.02592
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00240	0.00183	0.02274
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01077	0.01015	0.02387
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00026	-0.00065	0.01025
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00074	0.01023
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00862	0.00781	0.02594
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00242	0.00185	0.02276
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01079	0.01017	0.02389
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00024	-0.00063	0.01028

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)	0.01010	0.01020	0.02177
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01352	0.01370	0.03538
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01119	0.01121	0.02253
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01012	0.01022	0.02179
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01354	0.01372	0.03540
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01121	0.01123	0.02256

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00292	0.00291	0.00893	0.85605	0.84920
sky130_osu_sc_12T_ms__dffr_l	0.00292	0.00291	0.00893	0.62817	0.62828

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	3.60899	6.23472
sky130_osu_sc_12T_ms__dffr_l	0.00000	6.10075	8.72649

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)	0.53792	2.08339	19.06420
	QN->Q (FR)	0.04286	0.90724	11.74270
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.53821	2.25388	19.25780
	QN->Q (FR)	0.04567	0.93984	11.22820

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)	0.55437	2.17969	20.31910
	QN->Q (RF)	0.04138	0.86283	11.16710
	RN->Q (FF)	0.40699	2.01978	19.55190
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.55921	2.40495	20.90900
	QN->Q (RF)	0.04769	0.96354	11.57220
	RN->Q (FF)	0.41337	2.24524	20.13110

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)	0.48544	1.24286	8.54126
	RN->QN (FR)	0.33771	1.08338	7.77565
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.47792	1.28828	8.44630
	RN->QN (FR)	0.33055	1.12855	7.67268

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)**	0.46899	1.18400	7.74567
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.46511	1.26655	8.23864

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)	-0.13560	-0.13863	-0.18252
	setup	CK (R)	0.41156	0.40488	0.84179
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.13497	-0.13886	-0.18256
	setup	CK (R)	0.41172	0.40386	0.84574

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)	-0.20340	-0.40828	-1.78794
	setup	CK (R)	0.24657	0.42395	1.81170
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.20346	-0.40939	-1.78818
	setup	CK (R)	0.24657	0.42395	1.81170

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)	-0.13560	-0.13863	-0.18252
	setup	CK (R)	0.41156	0.40488	0.84179
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.13497	-0.13886	-0.18256
	setup	CK (R)	0.41172	0.40386	0.84574

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)	-0.20340	-0.40828	-1.78794
	setup	CK (R)	0.24657	0.42395	1.81170
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.20346	-0.40939	-1.78818
	setup	CK (R)	0.24657	0.42395	1.81170

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)	0.32428	0.33991	1.01969
	removal	CK (R)	-0.06750	-0.07221	-0.11705
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.32378	0.33969	1.02635
	removal	CK (R)	-0.06750	-0.07221	-0.11705

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)	0.32428	0.33991	1.01969
	removal	CK (R)	-0.06750	-0.07221	-0.11705
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.32378	0.33969	1.02635
	removal	CK (R)	-0.06750	-0.07221	-0.11705

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 ()	0.24919	0.52490	13.33370
	min_pulse_width	RN ()	0.24526	0.52490	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.24132	0.52490	13.33370
	min_pulse_width	RN ()	0.24132	0.52490	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 ()	0.25707	0.52490	13.33370
	min_pulse_width	CK ()	0.29646	0.52490	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.24526	0.52490	13.33370
	min_pulse_width	CK ()	0.28858	0.52490	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 ()	0.51949	0.53146	13.33370
	min_pulse_width	CK ()	0.21375	0.52490	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.51762	0.53364	13.33370
	min_pulse_width	CK ()	0.21375	0.52490	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	0.00671	0.00622	0.01086
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00602	0.00562	0.01264

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	0.00706	0.00584
	RN	-0.00087	-0.04150	-0.54787
	RN	0.01725	0.01676	0.01559
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00702	0.00654	0.00859
	RN	-0.00087	-0.03447	-0.40202
	RN	0.01656	0.01622	0.01845

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	0.00768	0.00703	0.00579
	RN	-0.00087	-0.04130	-0.54323
	RN	0.01724	0.01674	0.01566
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00698	0.00649	0.00847
	RN	-0.00087	-0.03447	-0.40192
	RN	0.01653	0.01620	0.01834

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	0.00668	0.00619	0.01075
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00598	0.00559	0.01273

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	-0.00159	-0.00194	-0.00199
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00825	0.00787	0.01536
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00339	0.00306	0.01064
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00157	-0.00192	-0.00197
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00827	0.00789	0.01538
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00342	0.00308	0.01067

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	0.00203	0.00205	0.00204
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01294	0.01278	0.02086
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00641	0.00627	0.01420
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00206	0.00207	0.00207
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01296	0.01280	0.02088
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00643	0.00629	0.01422

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)	0.00257	0.00249	0.01348
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00760	0.00739	0.01867
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)	0.00259	0.00251	0.01350
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00762	0.00741	0.01869

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)	0.00653	0.00674	0.01824
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01312	0.01313	0.02448
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)	0.00655	0.00676	0.01826
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01314	0.01315	0.02450

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)	-0.00053	-0.00083	0.01014
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00409	0.00356	0.01491
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00052	-0.00086	0.01011
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00051	-0.00080	0.01016
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00411	0.00358	0.01494
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00050	-0.00084	0.01013

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)	0.00995	0.01001	0.02169
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02075	0.02034	0.03265
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01575	0.01562	0.02703
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02037	0.02042	0.04096
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01115	0.01117	0.02253
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00997	0.01004	0.02171
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02077	0.02036	0.03267
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01577	0.01565	0.02705
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02040	0.02045	0.04098
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01117	0.01119	0.02255

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00288	0.00292	0.00675	0.00905	0.87362	0.87536
sky130_osu_sc_12T_ms__dffsr_l	0.00288	0.00292	0.00674	0.00905	0.62834	0.62872

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	2.39637	3.24520
sky130_osu_sc_12T_ms__dffsr_l	0.00000	4.88813	5.73697

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)	0.57182	2.13157	19.33180
	QN->Q (FR)	0.04094	0.88360	11.48580
	RN->Q (RR)	0.45520	2.03634	19.28380
	SN->Q (FR)	0.40626	1.94939	18.67380
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.57942	2.30863	19.36180
	QN->Q (FR)	0.04558	0.93970	11.22500
	RN->Q (RR)	0.46286	2.21371	19.30890
	SN->Q (FR)	0.41161	2.12150	18.69340

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)	0.66705	2.30761	20.56330
	QN->Q (RF)	0.04108	0.86831	11.29580
	RN->Q (FF)	0.42588	2.04864	19.74100
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.67323	2.53539	21.05230
	QN->Q (RF)	0.04747	0.96298	11.56850
	RN->Q (FF)	0.43429	2.28054	20.22710

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)	0.59473	1.37019	8.71712
	RN->QN (FR)	0.35619	1.11244	7.90163
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.58751	1.41769	8.59301
	RN->QN (FR)	0.35214	1.16245	7.77178

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)	0.50509	1.23932	8.02304
	RN->QN (RF)	0.38877	1.14437	7.97333
	SN->QN (FF)	0.33984	1.05779	7.36608
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.50714	1.32195	8.35091
	RN->QN (RF)	0.39056	1.22770	8.29138
	SN->QN (FF)	0.33956	1.13544	7.67272

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)	-0.15712	-0.16072	-0.27814
	setup	CK (R)	0.42753	0.41405	0.91912
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15800	-0.16104	-0.28047
	setup	CK (R)	0.42602	0.41270	0.91874

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)	-0.23720	-0.43662	-1.87471
	setup	CK (R)	0.30995	0.45407	1.89247
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.24007	-0.43365	-1.87438
	setup	CK (R)	0.31123	0.45407	1.89499

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)	-0.15712	-0.16072	-0.27814
	setup	CK (R)	0.42753	0.41405	0.91912
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15800	-0.16104	-0.28047
	setup	CK (R)	0.42602	0.41270	0.91874

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)	-0.23720	-0.43662	-1.87471
	setup	CK (R)	0.30995	0.45407	1.89247
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.24007	-0.43365	-1.87438
	setup	CK (R)	0.31123	0.45407	1.89499

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)	0.30638	0.31340	0.99357
	removal	CK (R)	-0.04760	-0.05284	-0.09638
	hold	SN (R)	-0.32426	-0.52521	-2.07671
	setup	SN (R)	0.37224	0.57541	3.73240
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.30496	0.31262	0.99536
	removal	CK (R)	-0.04760	-0.05284	-0.09638
	hold	SN (R)	-0.31806	-0.51953	-2.04444
	setup	SN (R)	0.36521	0.56865	3.68716

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)	0.30638	0.31340	0.99357
	removal	CK (R)	-0.04760	-0.05284	-0.09638
	hold	SN (R)	-0.32452	-0.52521	-2.07671
	hold	SN (R)	-0.32426	-0.52800	-2.08892
	setup	SN (R)	0.36763	0.56980	3.59312
	setup	SN (R)	0.37224	0.57541	3.73240
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.30496	0.31262	0.99536
	removal	CK (R)	-0.04760	-0.05284	-0.09638
	hold	SN (R)	-0.31806	-0.51953	-2.04805
	hold	SN (R)	-0.32134	-0.52173	-2.04444
	setup	SN (R)	0.36521	0.56426	3.51976
	setup	SN (R)	0.35127	0.56865	3.68716

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 ()	0.27677	0.52490	13.33370
	min_pulse_width	RN ()	0.28464	0.52490	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.27677	0.52490	13.33370
	min_pulse_width	RN ()	0.27677	0.52490	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)	0.10289	0.12337	2.43141
	removal	CK (R)	-0.04268	-0.08683	-0.42093
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.10192	0.12330	2.30374
	removal	CK (R)	-0.04268	-0.08683	-0.42093

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)	0.10289	0.12337	2.43141
	removal	CK (R)	-0.04268	-0.08683	-0.42093
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.10192	0.12330	2.30374
	removal	CK (R)	-0.04268	-0.08683	-0.42093

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 ()	0.30828	0.52490	13.33370
	min_pulse_width	SN ()	0.32009	0.52490	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.30828	0.52490	13.33370
	min_pulse_width	SN ()	0.30434	0.52490	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 ()	0.27677	0.52490	13.33370
	min_pulse_width	CK ()	0.32009	0.52490	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.26889	0.52490	13.33370
	min_pulse_width	CK ()	0.31615	0.52490	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 ()	0.53638	0.54457	13.33370
	min_pulse_width	CK ()	0.28464	0.52490	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.53638	0.54457	13.33370
	min_pulse_width	CK ()	0.28464	0.52490	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	0.00836	0.00790	0.01204
	RN	0.01517	0.01487	0.01572
	SN	-0.00087	-0.04201	-0.55912
	SN	0.01695	0.01640	0.01810
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00772	0.00734	0.01402
	RN	0.01451	0.01431	0.01774
	SN	-0.00087	-0.03448	-0.40214
	SN	0.01630	0.01585	0.02022

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	0.00854	0.00931
	RN	-0.00087	-0.04201	-0.55911
	RN	0.01811	0.01771	0.01867
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00828	0.00785	0.00988
	RN	-0.00087	-0.03448	-0.40214
	RN	0.01742	0.01702	0.01926

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	0.00894	0.00851	0.00919
	RN	-0.00087	-0.04206	-0.55988
	RN	0.01808	0.01769	0.01869
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00825	0.00782	0.00983
	RN	-0.00087	-0.03449	-0.40221
	RN	0.01738	0.01699	0.01931

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	0.00833	0.00787	0.01216
	RN	0.01514	0.01484	0.01550
	SN	-0.00087	-0.04206	-0.56018
	SN	0.01692	0.01637	0.01815
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00767	0.00730	0.01382
	RN	0.01447	0.01426	0.01764
	SN	-0.00087	-0.03449	-0.40236
	SN	0.01626	0.01580	0.02012

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	-0.00197	-0.00199	-0.00200
	(!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)	0.01041	0.01007	0.01747
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00375	0.00344	0.01089
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00374	0.00342	0.01091
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00377	0.00346	0.01091
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00195	-0.00197	-0.00198
	(!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)	0.01044	0.01009	0.01749
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00378	0.00346	0.01091
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00376	0.00345	0.01093
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00379	0.00348	0.01093

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	0.00206	0.00206	0.00204
	(!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)	0.01498	0.01478	0.02260
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00687	0.00678	0.01465
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00698	0.00685	0.01466
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00685	0.00676	0.01462
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00208	0.00208	0.00206
	(!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)	0.01500	0.01480	0.02262
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00690	0.00681	0.01467
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00700	0.00687	0.01468
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00687	0.00679	0.01465

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)	0.00202	0.00191	0.01279
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00895	0.00868	0.01959
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)	0.00205	0.00193	0.01282
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00898	0.00870	0.01962

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)	0.00701	0.00726	0.01888
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01380	0.01378	0.02518
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)	0.00703	0.00728	0.01890
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01383	0.01380	0.02520

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)	-0.00498	-0.00500	-0.00502
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00471	-0.00534	-0.00541
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00471	-0.00504	-0.00505
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00276	0.00243	0.01019
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)	-0.00496	-0.00498	-0.00500
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00469	-0.00531	-0.00539
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00469	-0.00502	-0.00503
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00278	0.00255	0.01021

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)	0.00506	0.00510	0.00508
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00545	0.00549	0.00546
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00507	0.00511	0.00511
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01130	0.01107	0.01836
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)	0.00508	0.00512	0.00510
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00547	0.00551	0.00548
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00509	0.00513	0.00513
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01132	0.01109	0.01838

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)	-0.00058	-0.00089	0.01006
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00478	0.00429	0.01559
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00466	0.00417	0.01554
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00043	-0.00078	0.01017
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00253	0.00192	0.02264
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00056	-0.00087	0.01008
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00481	0.00431	0.01562
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00468	0.00419	0.01556
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00041	-0.00076	0.01019
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00255	0.00194	0.02266

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)	0.02318	0.02282	0.03497
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01013	0.01020	0.02184
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01602	0.01596	0.02736
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01607	0.01599	0.02735
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02248	0.02241	0.04288
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01113	0.01114	0.02250
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01371	0.01388	0.03562
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02321	0.02284	0.03499
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01015	0.01022	0.02186
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01604	0.01598	0.02738
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01609	0.01602	0.02737
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02250	0.02243	0.04291
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01116	0.01116	0.02253
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01374	0.01391	0.03564

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00290	0.00542	0.00897	0.84666	0.85047
sky130_osu_sc_12T_ms__dffs_l	0.00290	0.00542	0.00897	0.62595	0.62936

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	5.47809	12.97190
sky130_osu_sc_12T_ms__dffs_l	0.00000	7.96983	15.46370

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)	0.41329	1.92584	18.70440
	QN->Q (FR)	0.04282	0.90209	11.63070
	SN->Q (FR)	0.28613	1.82563	17.77720
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.41937	2.11350	19.04080
	QN->Q (FR)	0.04563	0.93695	11.18160
	SN->Q (FR)	0.29294	2.00915	18.06990

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)	0.64488	2.27912	20.20140
	QN->Q (RF)	0.04122	0.85718	11.06680
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.64339	2.50031	20.92220
	QN->Q (RF)	0.04757	0.96058	11.53310

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)	0.57057	1.35139	8.64749
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.55637	1.38686	8.54748

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)	0.35030	1.03863	7.60051
	SN->QN (FF)	0.22295	0.93933	6.67502
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.35143	1.13289	8.10622
	SN->QN (FF)	0.22472	1.02844	7.13359

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)	-0.11552	-0.12233	-0.15860
	setup	CK (R)	0.29810	0.30146	0.80903
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11547	-0.12190	-0.15669
	setup	CK (R)	0.29895	0.30055	0.81132

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)	-0.21952	-0.41230	-1.81619
	setup	CK (R)	0.29496	0.43373	1.83943
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.21711	-0.41297	-1.81592
	setup	CK (R)	0.29501	0.43373	1.83942

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)	-0.11552	-0.12233	-0.15860
	setup	CK (R)	0.29810	0.30146	0.80903
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11547	-0.12190	-0.15669
	setup	CK (R)	0.29895	0.30055	0.81132

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)	-0.21952	-0.41230	-1.81619
	setup	CK (R)	0.29496	0.43373	1.83943
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.21711	-0.41297	-1.81592
	setup	CK (R)	0.29501	0.43373	1.83942

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)	0.11069	0.14159	1.51835
	removal	CK (R)	-0.05686	-0.10628	-0.76409
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.11045	0.14186	1.42934
	removal	CK (R)	-0.05686	-0.10628	-0.76409

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)	0.11069	0.14159	1.51835
	removal	CK (R)	-0.05686	-0.10628	-0.76409
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.11045	0.14186	1.42934
	removal	CK (R)	-0.05686	-0.10628	-0.76409

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 ()	0.18224	0.52490	13.33370
	min_pulse_width	SN ()	0.19012	0.52490	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.18224	0.52490	13.33370
	min_pulse_width	SN ()	0.18224	0.52490	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 ()	0.19405	0.52490	13.33370
	min_pulse_width	CK ()	0.32009	0.52490	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.19012	0.52490	13.33370
	min_pulse_width	CK ()	0.31221	0.52490	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 ()	0.40674	0.52490	13.33370
	min_pulse_width	CK ()	0.27283	0.52490	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.40674	0.52490	13.33370
	min_pulse_width	CK ()	0.27283	0.52490	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	0.00669	0.00624	0.01099
	SN	-0.00087	-0.04123	-0.54186
	SN	0.01418	0.01379	0.01763
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00601	0.00564	0.01279
	SN	-0.00087	-0.03440	-0.40061
	SN	0.01348	0.01319	0.01941

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	0.00776	0.00716	0.00616
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00708	0.00663	0.00874

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	0.00772	0.00711	0.00607
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00702	0.00656	0.00868

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	0.00667	0.00622	0.01083
	SN	-0.00087	-0.04134	-0.54425
	SN	0.01415	0.01375	0.01739
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00597	0.00560	0.01264
	SN	-0.00087	-0.03451	-0.40277
	SN	0.01345	0.01315	0.01925

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	-0.00191	-0.00193	-0.00194
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00790	0.00756	0.01541
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00335	0.00302	0.01058
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00189	-0.00191	-0.00192
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00792	0.00758	0.01543
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00337	0.00304	0.01060

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	0.00217	0.00218	0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01273	0.01252	0.02045
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00635	0.00626	0.01424
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00219	0.00220	0.00217
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01275	0.01254	0.02047
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00637	0.00628	0.01426

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)	-0.00360	-0.00361	-0.00362
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00260	0.00229	0.00961
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)	-0.00358	-0.00359	-0.00360
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00262	0.00231	0.00963

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)	0.00366	0.00370	0.00366
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00767	0.00766	0.01634
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	0.00372	0.00368
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00769	0.00768	0.01637

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)	-0.00053	-0.00083	0.01014
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00040	-0.00074	0.01024
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00218	0.00159	0.02254
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00051	-0.00081	0.01016
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00038	-0.00072	0.01026
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00220	0.00162	0.02256

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)	0.02055	0.02014	0.03268
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00995	0.01002	0.02169
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02001	0.01993	0.04041
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01115	0.01117	0.02254
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01300	0.01319	0.03513
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02057	0.02017	0.03270
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00997	0.01004	0.02171
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02003	0.01995	0.04043
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01117	0.01119	0.02256
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01302	0.01321	0.03515

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00305	0.00888	0.78883
sky130_osu_sc_12T_ms__dff_l	0.00305	0.00888	0.59877

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	1.99474	2.28158
sky130_osu_sc_12T_ms__dff_l	0.00000	4.48647	4.77334

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)**	0.36645	1.10910	8.30643
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.36842	1.16648	8.28913

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)**	0.50630	1.18238	7.34222
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.50753	1.28426	7.97666

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)	-0.11379	-0.12477	-0.19807
	setup	CK (R)	0.26705	0.27061	0.79743
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.11362	-0.12429	-0.19899
	setup	CK (R)	0.26650	0.26661	0.80402

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)	-0.18831	-0.40933	-1.81034
	setup	CK (R)	0.22692	0.42416	1.83027
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.18775	-0.40830	-1.81018
	setup	CK (R)	0.22684	0.42416	1.83027

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 ()	0.18224	0.52490	13.33370
	min_pulse_width	CK ()	0.28070	0.52490	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.17830	0.52490	13.33370
	min_pulse_width	CK ()	0.27283	0.52490	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 ()**	0.37129	0.52490	13.33370
	min_pulse_width	**CK ()**	0.18618	0.52490	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.37129	0.52490	13.33370
	min_pulse_width	**CK ()**	0.18618	0.52490	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	0.01411	0.01350	0.03214
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01268	0.01203	0.03064

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	0.01554	0.01516	0.02645
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01415	0.01374	0.02505

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	-0.00158	-0.00194	-0.00199
	!CK	0.00000	0.00000	0.00000
	!CK	0.00738	0.00700	0.01478
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00156	-0.00192	-0.00196
	!CK	0.00000	0.00000	0.00000
	!CK	0.00740	0.00702	0.01480

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	0.00201	0.00203	0.00203
	!CK	0.00000	0.00000	0.00000
	!CK	0.01313	0.01290	0.02114
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00204	0.00205	0.00205
	!CK	0.00000	0.00000	0.00000
	!CK	0.01315	0.01293	0.02116

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)	-0.00056	-0.00085	0.01013
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00049	-0.00082	0.01016
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00054	-0.00083	0.01015
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00047	-0.00080	0.01018

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)	0.00992	0.01000	0.02168
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02000	0.01961	0.03221
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02030	0.02028	0.04115
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01100	0.01102	0.02239
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00995	0.01002	0.02170
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02002	0.01964	0.03223
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02033	0.02030	0.04118
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01102	0.01104	0.02241

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00295	0.78129
sky130_osu_sc_12T_ms__inv_10	0.02648	7.71449
sky130_osu_sc_12T_ms__inv_2	0.00549	1.59453
sky130_osu_sc_12T_ms__inv_3	0.00813	2.35585
sky130_osu_sc_12T_ms__inv_4	0.01071	3.14175
sky130_osu_sc_12T_ms__inv_6	0.01604	4.68996
sky130_osu_sc_12T_ms__inv_8	0.02126	6.23268
sky130_osu_sc_12T_ms__inv_l	0.00226	0.56927

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.28005	0.48525
sky130_osu_sc_12T_ms__inv_10	0.00000	2.06944	3.82051
sky130_osu_sc_12T_ms__inv_2	0.00000	0.41389	0.76410
sky130_osu_sc_12T_ms__inv_3	0.00000	0.69394	1.24935
sky130_osu_sc_12T_ms__inv_4	0.00000	0.82778	1.52820
sky130_osu_sc_12T_ms__inv_6	0.00000	1.24166	2.29231
sky130_osu_sc_12T_ms__inv_8	0.00000	1.65555	3.05641
sky130_osu_sc_12T_ms__inv_l	0.00000	1.52589	2.98983

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)**	0.04187	0.84531	10.68510
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.04033	0.52962	10.57790
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.03047	0.71002	10.63080
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.03174	0.65833	10.64770
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.03046	0.61798	10.57570
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.03242	0.57568	10.57570
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.03598	0.54831	10.58120
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.04603	0.87997	10.30800

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)**	0.03907	0.79216	10.05080
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.04103	0.53275	10.21450
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02974	0.68897	10.18060
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.03108	0.64601	10.26300
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02965	0.61229	10.22690
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.03305	0.57617	10.25010
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03682	0.55123	10.25940
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.04660	0.89481	10.54230

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	0.00342	0.00357	0.00530
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02815	0.03129	0.04839
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00589	0.00619	0.00976
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00906	0.00969	0.01489
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01151	0.01251	0.01942
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01707	0.01868	0.02910
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02262	0.02533	0.03873
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00263	0.00258	0.00441

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	-0.00058	-0.00056	0.00059
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01057	-0.00812	0.00344
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00196	-0.00176	0.00056
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00255	-0.00220	0.00125
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00400	-0.00327	0.00125
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00614	-0.00525	0.00192
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00833	-0.00700	0.00267
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00033	-0.00035	0.00030

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.02296	0.02285	0.00606	0.01839

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.70690	0.78202

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)	-	0.02356	0.19458	0.76418
	A1->Y (RR)	-	0.02801	0.19857	0.76692
	S0->Y (RR)	(!A0 * A1)	0.08420	0.34031	1.31857
	S0->Y (FR)	(A0 * !A1)	0.04406	0.26815	0.92611

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)	-	0.02646	0.19954	0.77341
	A1->Y (FF)	-	0.02242	0.19550	0.77249
	S0->Y (FF)	(!A0 * A1)	0.09839	0.31987	0.60212
	S0->Y (RF)	(A0 * !A1)	0.04164	0.30313	1.60496

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	-	-0.00323	-0.00324	-0.00325
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00220	-0.00220	-0.00221
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00429	0.00462	0.01682
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00218	-0.00227	0.00930

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	-	0.00324	0.00325	0.00325
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00222	0.00223	0.00223
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00064	0.00055	0.01246
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00903	0.00926	0.02117

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)	-0.00079	-0.00079	-0.00079

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)	-0.00094	-0.00094	-0.00094

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)	0.00094	0.00094	0.00094

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)	-0.00080	-0.00091	0.01086
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00077	-0.00091	0.01091

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)	0.00700	0.00725	0.01921
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00634	0.00664	0.01883

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00293	0.00293	0.51686
sky130_osu_sc_12T_ms__nand2_l	0.00221	0.00224	0.37830

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.25687	0.76410
sky130_osu_sc_12T_ms__nand2_l	0.00000	1.51202	5.83037

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)	0.04366	0.73415	8.47824
	B->Y (FR)	0.04935	0.72224	8.28065
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.04625	0.76326	8.18759
	B->Y (FR)	0.05373	0.76997	8.18662

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)	0.06993	0.99309	11.13880
	B->Y (RF)	0.07807	0.96715	10.55710
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.07970	1.11673	11.52590
	B->Y (RF)	0.08781	1.09432	10.98380

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	0.00360	0.00375	0.00570
	B	0.00000	0.00000	0.00000
	B	0.00449	0.00458	0.00657
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00264	0.00272	0.00467
	B	0.00000	0.00000	0.00000
	B	0.00324	0.00330	0.00528

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	-0.00044	0.00088
	B	0.00000	0.00000	0.00000
	B	-0.00035	-0.00048	0.00064
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00008	-0.00011	0.00058
	B	0.00000	0.00000	0.00000
	B	-0.00006	-0.00016	0.00042

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)	-0.00228	-0.00230	-0.00231
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00158	-0.00159	-0.00160

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)	0.00230	0.00231	0.00232
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00160	0.00161	0.00161

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)	-0.00215	-0.00216	-0.00216
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)	0.00218	0.00219	0.00216
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00153	0.00154	0.00152

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00289	0.00317	0.41133
sky130_osu_sc_12T_ms__nor2_l	0.00213	0.00234	0.30089

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.27965	0.48524
sky130_osu_sc_12T_ms__nor2_l	0.00000	1.17649	2.98903

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)	0.09449	0.98803	9.86729
	B->Y (FR)	0.07478	0.98716	10.26730
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.09727	1.04515	9.57047
	B->Y (FR)	0.08198	1.04199	9.86726

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)	0.05421	0.67200	7.39606
	B->Y (RF)	0.04187	0.65676	7.37436
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.06043	0.74505	7.75604
	B->Y (RF)	0.04883	0.73053	7.73743

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	0.00480	0.00476	0.00630
	B	0.00000	0.00000	0.00000
	B	0.00372	0.00382	0.00613
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00340	0.00338	0.00466
	B	0.00000	0.00000	0.00000
	B	0.00273	0.00279	0.00509

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	0.00060	0.00051	0.00213
	B	0.00000	0.00000	0.00000
	B	-0.00044	-0.00039	0.00120
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00046	0.00037	0.00136
	B	0.00000	0.00000	0.00000
	B	-0.00021	-0.00021	0.00072

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)	-0.00161	-0.00199	-0.00202
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00101	-0.00129	-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)	0.00202	0.00204	0.00203
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00139	0.00140	0.00139

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)	-0.00090	-0.00091	-0.00090
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00063	-0.00062	-0.00062

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)	0.00095	0.00095	0.00092
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00067	0.00064

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00293	0.00303	0.00252	0.40870

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	1.31545	3.47499

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)	0.10317	1.01817	10.27100
	A1->Y (FR)	0.12673	1.02281	9.87465
	B0->Y (FR)	0.05925	0.79497	8.53758

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)	0.09320	0.91716	9.24693
	A1->Y (RF)	0.11927	0.92846	9.12555
	B0->Y (RF)	0.07333	0.93797	9.90101

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	0.00506	0.00508	0.00713
	A1	0.00000	0.00000	0.00000
	A1	0.00620	0.00613	0.00750
	B0	0.00419	0.00437	0.00721

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	0.00031	0.00021	0.00132
	A1	0.00000	0.00000	0.00000
	A1	0.00136	0.00114	0.00226
	B0	0.00058	0.00055	0.00185

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)	-0.00089	-0.00090	-0.00088
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00203	-0.00205	-0.00204
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00208	-0.00209	-0.00208

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	0.00098	0.00095
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00203	0.00205	0.00204
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00209	0.00210	0.00209

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)	-0.00153	-0.00190	-0.00193
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00201	-0.00204	-0.00202
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00205	-0.00207	-0.00206

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)	0.00198	0.00199	0.00199
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00201	0.00204	0.00202
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00206	0.00208	0.00206

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)	-0.00164	-0.00165	-0.00170

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)	0.00170	0.00171	0.00171

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00277	0.00289	0.00307	0.00304	0.42437

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.34831	0.77378

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)	0.12807	1.02269	9.93144
	A1->Y (FR)	0.11550	1.02517	10.34150
	B0->Y (FR)	0.08091	0.99025	10.31310
	B1->Y (FR)	0.10265	0.99301	9.90444

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)	0.16033	1.00840	9.56803
	A1->Y (RF)	0.12793	0.97159	9.50028
	B0->Y (RF)	0.11078	0.99287	10.16330
	B1->Y (RF)	0.14457	1.03051	10.23500

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	0.00796	0.00790	0.00923
	A1	0.00682	0.00685	0.00882
	B0	0.00502	0.00514	0.00708
	B1	0.00623	0.00619	0.00752

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00203	0.00184	0.00293
	A1	0.00109	0.00096	0.00203
	B0	-0.00013	-0.00015	0.00130
	B1	0.00204	0.00186	0.00322

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)	-0.00158	-0.00195	-0.00198
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00158	-0.00195	-0.00198
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00195	-0.00197	-0.00196
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00200	-0.00201	-0.00200

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)	0.00198	0.00199	0.00199
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00198	0.00200	0.00199
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00195	0.00197	0.00196
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00201	0.00201	0.00201

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)	-0.00088	-0.00088	-0.00088
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00087	-0.00088	-0.00088
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00194	-0.00196	-0.00195
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00199	-0.00201	-0.00200

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)	0.00092	0.00093	0.00090
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00093	0.00093	0.00090
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00194	0.00196	0.00195
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00200	0.00201	0.00200

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)	-0.00090	-0.00089	-0.00089
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00088	-0.00089	-0.00089
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00224	-0.00225	-0.00225
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00221	-0.00221	-0.00228

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)	0.00093	0.00094	0.00091
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00095	0.00095	0.00091
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00226	0.00228	0.00225
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00229	0.00230	0.00230

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	-0.00194	-0.00197
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00156	-0.00194	-0.00196
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00228	-0.00232	-0.00230
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00224	-0.00226	-0.00232

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)	0.00197	0.00198	0.00198
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00197	0.00197	0.00198
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00231	0.00232	0.00230
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00234	0.00238	0.00234

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00324	0.00302	0.80603
sky130_osu_sc_12T_ms__or2_2	0.00325	0.00302	1.64510
sky130_osu_sc_12T_ms__or2_4	0.00325	0.00302	3.26744
sky130_osu_sc_12T_ms__or2_8	0.00325	0.00302	6.41104
sky130_osu_sc_12T_ms__or2_l	0.00238	0.00224	0.59552

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.46080	0.56010
sky130_osu_sc_12T_ms__or2_2	0.00000	0.52212	0.82778
sky130_osu_sc_12T_ms__or2_4	0.00000	0.76091	1.59189
sky130_osu_sc_12T_ms__or2_8	0.00000	1.23847	3.12011
sky130_osu_sc_12T_ms__or2_l	0.00000	1.97462	3.05095

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)	0.12238	0.88401	8.13342
	B->Y (RR)	0.10394	0.83533	7.94272
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.13056	0.79671	8.25047
	B->Y (RR)	0.11195	0.75434	8.08725
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.16612	0.79130	8.59406
	B->Y (RR)	0.14726	0.75958	8.44620
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.23590	0.85679	9.08066
	B->Y (RR)	0.21665	0.83183	8.95580
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.12976	0.96004	8.31934
	B->Y (RR)	0.11153	0.91563	8.17896

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)	0.20191	0.84937	6.58027
	B->Y (FF)	0.17350	0.82632	6.55316
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.23792	0.83530	6.96872
	B->Y (FF)	0.20955	0.82264	6.96363
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.33481	0.91496	7.50985
	B->Y (FF)	0.30658	0.91296	7.54218
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.53328	1.12484	8.16601
	B->Y (FF)	0.50507	1.12040	8.27366
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.21204	0.93790	6.79103
	B->Y (FF)	0.18665	0.91237	6.71999

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	0.00382	0.00364	0.01114
	B	0.00000	0.00000	0.00000
	B	0.00278	0.00278	0.01116
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00623	0.00631	0.01387
	B	0.00000	0.00000	0.00000
	B	0.00517	0.00542	0.01369
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01186	0.01223	0.01969
	B	0.00000	0.00000	0.00000
	B	0.01074	0.01141	0.01935
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02359	0.02385	0.03219
	B	0.00000	0.00000	0.00000
	B	0.02245	0.02339	0.03201
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00276	0.00837
	B	0.00000	0.00000	0.00000
	B	0.00222	0.00218	0.00927

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	0.00793	0.00779	0.01555
	B	0.00000	0.00000	0.00000
	B	0.00655	0.00694	0.01715
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00963	0.00980	0.01726
	B	0.00000	0.00000	0.00000
	B	0.00824	0.00887	0.01870
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01429	0.01456	0.02169
	B	0.00000	0.00000	0.00000
	B	0.01292	0.01355	0.02293
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02619	0.02402	0.03113
	B	0.00000	0.00000	0.00000
	B	0.02482	0.02310	0.03210
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00583	0.00577	0.01194
	B	0.00000	0.00000	0.00000
	B	0.00489	0.00529	0.01408

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)	-0.00162	-0.00201	-0.00204
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00163	-0.00201	-0.00204
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00163	-0.00201	-0.00204
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00162	-0.00201	-0.00203
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00100	-0.00130	-0.00133

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)	0.00203	0.00205	0.00205
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00203	0.00205	0.00205
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00203	0.00205	0.00205
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00203	0.00205	0.00205
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00139	0.00140	0.00140

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)	-0.00091	-0.00092	-0.00090
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00091	-0.00092	-0.00090
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00090	-0.00092	-0.00090
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00090	-0.00092	-0.00090
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00061	-0.00062	-0.00061

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)	0.00096	0.00097	0.00092
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00097	0.00092
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00097	0.00092
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00097	0.00097	0.00093
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00063

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00314	0.00404	0.42329
sky130_osu_sc_12T_ms__tbufi_l	0.00235	0.00301	0.30044

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.36782	0.97049
sky130_osu_sc_12T_ms__tbufi_l	0.00000	1.59829	5.97873

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)	0.06949	0.97710	10.27700
	OE->Y (FR)	0.06709	0.35293	4.68819
	OE->Y (RR)	0.13158	0.97422	7.84940
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.07858	1.03474	9.84953
	OE->Y (FR)	0.06526	0.35286	4.68811
	OE->Y (RR)	0.13988	1.07415	8.02185

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)	0.06903	0.92332	9.87549
	OE->Y (FF)	0.06847	0.35295	4.68819
	OE->Y (RF)	0.06069	0.87852	9.25186
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.07965	1.02257	10.04260
	OE->Y (FF)	0.06653	0.35285	4.68810
	OE->Y (RF)	0.06977	0.97993	9.46150

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	0.00350	0.00360	0.00560
	OE	0.00000	0.00000	0.00000
	OE	0.00347	0.00343	0.01460
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00266	0.00273	0.00468
	OE	0.00000	0.00000	0.00000
	OE	0.00254	0.00249	0.01188

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	-0.00042	-0.00042	0.00096
	OE	0.00000	0.00000	0.00000
	OE	0.00214	0.00211	0.01417
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00011	-0.00013	0.00066
	OE	0.00000	0.00000	0.00000
	OE	0.00162	0.00156	0.01155

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)	-0.00158	-0.00159	-0.00158
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00136	-0.00137	-0.00137
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00112	-0.00113	-0.00113
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00098	-0.00097	-0.00097

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)	0.00158	0.00159	0.00158
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00140	0.00140	0.00139
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00112	0.00113	0.00113
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00101	0.00101	0.00099

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)	0.00131	0.00137	0.01339
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00111	0.00115	0.01316
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00097	0.00099	0.01094
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00078	0.00078	0.01074

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)	0.00420	0.00438	0.01656
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00420	0.00442	0.01662
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00317	0.00344	0.01378
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00312	0.00342	0.01379

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00313	0.00475	0.42400
sky130_osu_sc_12T_ms__tnbufi_l	0.00225	0.00351	0.30061

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.50462	0.59962
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	2.57428	3.08481

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)	0.07035	0.97787	10.28830
	OE->Y (RR)	0.04850	0.35325	4.68851
	OE->Y (FR)	0.08376	0.97190	9.84481
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.07745	1.03426	9.85113
	OE->Y (RR)	0.05480	0.35293	4.68821
	OE->Y (FR)	0.08879	1.03700	9.52572

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)	0.06769	0.92340	9.88512
	OE->Y (RF)	0.04806	0.35327	4.68850
	OE->Y (FF)	0.10253	0.78494	6.01279
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.07621	1.02054	10.04360
	OE->Y (RF)	0.05434	0.35298	4.68822
	OE->Y (FF)	0.11321	0.85926	5.71476

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	0.00361	0.00370	0.00571
	OE	0.00000	0.00000	0.00000
	OE	0.00858	0.00905	0.02164
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00263	0.00272	0.00467
	OE	0.00000	0.00000	0.00000
	OE	0.00636	0.00680	0.01744

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	-0.00059	-0.00057	0.00080
	OE	0.00000	0.00000	0.00000
	OE	0.00736	0.00790	0.02004
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00034	-0.00035	0.00044
	OE	0.00000	0.00000	0.00000
	OE	0.00554	0.00602	0.01637

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)	-0.00131	-0.00132	-0.00132
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00111	-0.00112	-0.00111
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00091	-0.00091	-0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00073	-0.00074	-0.00072

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)	0.00131	0.00132	0.00132
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00114	0.00114	0.00113
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00091	0.00091	0.00091
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00080	0.00081	0.00079

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)	-0.00219	-0.00241	0.00983
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00227	-0.00242	0.00985
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00140	-0.00160	0.00851
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00153	-0.00166	0.00848

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	0.00693	0.01953
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00629	0.00682	0.01939
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00484	0.00533	0.01591
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00472	0.00522	0.01580

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00628	0.00541	0.43663

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.97000	1.34775

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	0.16638	1.03175	8.10002
	A->Y (FR)	!B	0.09312	1.00901	10.43050
	B->Y (RR)	A	0.13630	1.00363	8.10713
	B->Y (FR)	!A	0.11323	1.00677	10.02020

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	0.18826	0.93691	6.51447
	A->Y (RF)	!B	0.09127	0.91559	9.48240
	B->Y (FF)	A	0.15289	0.90426	6.48610
	B->Y (RF)	!A	0.11639	0.94597	9.51159

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	0.00368	0.00349	0.01466
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00879	0.00905	0.02335
	B	A	0.00000	0.00000	0.00000
	B	A	0.00150	0.00157	0.01360
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00938	0.00969	0.02330

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	0.01039	0.01032	0.02243
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00226	0.00209	0.01513
	B	A	0.00000	0.00000	0.00000
	B	A	0.00926	0.00971	0.02211
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00300	0.00278	0.01584

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00631	0.00545	0.41765

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.97000	1.55597

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	0.16551	1.03651	8.09929
	A->Y (FR)	B	0.11576	1.01221	9.99654
	B->Y (RR)	!A	0.14171	1.01819	8.08827
	B->Y (FR)	A	0.12578	1.02488	10.00440

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	0.16466	0.89847	6.20940
	A->Y (RF)	B	0.10652	0.96345	9.84034
	B->Y (FF)	!A	0.15685	0.89665	6.25864
	B->Y (RF)	A	0.11301	0.93072	9.25068

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	0.01013	0.01038	0.02380
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00206	0.00161	0.01333
	B	A	0.00000	0.00000	0.00000
	B	A	0.01032	0.01063	0.02400
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00144	0.00142	0.01331

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	0.00204	0.00177	0.01490
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01054	0.01084	0.02255
	B	A	0.00000	0.00000	0.00000
	B	A	0.00208	0.00179	0.01462
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00938	0.00986	0.02210

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.26893
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	88816.30000	177632.00000
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
	-0.00138	0.02555	0.34686

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
	1.54643	1.46442	0.41669