sky130_osu_sc_12T_ms_tt_1P35_25C.ccs Library

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

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ms__addf_1	0.01044	0.01049	0.00811	0.70429	0.29876	0.64020
sky130_osu_sc_12T_ms__addf_l	0.01044	0.01049	0.00811	0.49945	0.29884	0.63780

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.01737	0.02136
sky130_osu_sc_12T_ms__addf_l	0.00000	0.05575	0.09819

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)	0.24454	2.20042	25.36920
	B->CO (RR)	0.23634	2.13871	24.76560
	CI->CO (RR)	0.23091	2.20276	25.64120
	CON->CO (FR)	0.04382	0.95692	12.33920
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.23664	2.00376	20.65610
	B->CO (RR)	0.22912	1.95714	20.34420
	CI->CO (RR)	0.22298	2.00616	20.94910
	CON->CO (FR)	0.04902	0.98575	11.65450

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)	0.43125	3.28135	36.79830
	B->CO (FF)	0.39254	3.16204	35.67140
	CI->CO (FF)	0.38605	3.21603	36.65940
	CON->CO (RF)	0.02985	0.67151	8.81517
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.41959	2.92360	28.99940
	B->CO (FF)	0.38298	2.82135	28.19060
	CI->CO (FF)	0.37438	2.85654	28.87490
	CON->CO (RF)	0.03312	0.70048	8.60022

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)	0.30885	1.43012	12.23960
	B->CON (FR)	0.27216	1.35674	11.93490
	CI->CON (FR)	0.26336	1.36439	12.14610
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.29488	1.41610	12.22720
	B->CON (FR)	0.25918	1.34343	11.92600
	CI->CON (FR)	0.24941	1.35051	12.13380

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)	0.13605	0.76553	7.34529
	B->CON (RF)	0.13068	0.75591	7.49638
	CI->CON (RF)	0.12233	0.76952	7.69162
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.13175	0.76125	7.34143
	B->CON (RF)	0.12657	0.75064	7.49266
	CI->CON (RF)	0.11801	0.76327	7.68778

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)	0.60647	3.17681	29.33770
	B->S (-R)	0.60664	3.14228	28.90230
	CI->S (-R)	0.55754	3.10321	29.17310
	CON->S (RR)	0.13687	0.98197	8.64913
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.58429	3.15474	29.23770
	B->S (-R)	0.58505	3.12086	28.80320
	CI->S (-R)	0.53547	3.08119	29.07500
	CON->S (RR)	0.13692	0.98063	8.62200

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)	0.44043	2.00064	17.34840
	B->S (-F)	0.43283	1.90893	16.97120
	CI->S (-F)	0.42570	1.99883	17.61790
	CON->S (FF)	0.18543	0.89134	6.68750
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.43062	1.99032	17.29640
	B->S (-F)	0.42357	1.89937	16.92260
	CI->S (-F)	0.41581	1.98825	17.56740
	CON->S (FF)	0.18549	0.89057	6.67374

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	0.00166	0.00157	0.00167
	B	0.00192	0.00191	0.00203
	CI	0.00194	0.00198	0.00213
sky130_osu_sc_12T_ms__addf_l	A	0.00151	0.00142	0.00148
	B	0.00177	0.00175	0.00181
	CI	0.00179	0.00182	0.00192

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00503	0.00503	0.00531
	B	0.00495	0.00500	0.00531
	CI	0.00435	0.00447	0.00478
sky130_osu_sc_12T_ms__addf_l	A	0.00491	0.00490	0.00507
	B	0.00482	0.00487	0.00505
	CI	0.00422	0.00434	0.00453

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00502	0.00500	0.00507
	B	0.00493	0.00497	0.00504
	CI	0.00435	0.00444	0.00451
sky130_osu_sc_12T_ms__addf_l	A	0.00490	0.00486	0.00494
	B	0.00481	0.00484	0.00491
	CI	0.00422	0.00431	0.00439

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00163	0.00156	0.00154
	B	0.00190	0.00188	0.00185
	CI	0.00193	0.00197	0.00199
sky130_osu_sc_12T_ms__addf_l	A	0.00149	0.00140	0.00139
	B	0.00175	0.00173	0.00170
	CI	0.00178	0.00181	0.00185

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00503	0.00503	0.00527
	B	0.00494	0.00500	0.00526
	CI	0.00435	0.00447	0.00475
sky130_osu_sc_12T_ms__addf_l	A	0.00491	0.00490	0.00514
	B	0.00482	0.00487	0.00513
	CI	0.00423	0.00434	0.00461

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01008	0.01013	0.01012
	B	0.00935	0.00913	0.00946
	CI	0.00834	0.00830	0.00833
sky130_osu_sc_12T_ms__addf_l	A	0.01009	0.01013	0.01012
	B	0.00936	0.00913	0.00946
	CI	0.00834	0.00830	0.00833

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00514	0.00539	0.68706	0.69671	0.69808
sky130_osu_sc_12T_ms__addh_l	0.00515	0.00539	0.49790	0.69992	0.50754

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.02015	0.02123
sky130_osu_sc_12T_ms__addh_l	0.00000	0.09692	0.09803

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)	0.16954	1.00051	8.61956
	B->CO (RR)	0.17364	1.00175	8.79440
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.16272	1.02570	8.21135
	B->CO (RR)	0.16680	1.03237	8.39625

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)	0.15242	0.84471	6.93545
	B->CO (FF)	0.15892	0.85832	7.03407
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.14895	0.86898	6.76612
	B->CO (FF)	0.15523	0.88392	6.87480

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)	0.23558	1.04138	8.57522
	B->CON (RR)	0.23944	1.04125	8.75034
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.21939	1.01998	8.53070
	B->CON (RR)	0.22329	1.02335	8.70829

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)	0.19373	0.87353	6.98422
	B->CON (FF)	0.19340	0.88052	7.07647
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.18001	0.85086	6.84695
	B->CON (FF)	0.17977	0.85928	6.94675

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)	0.27760	1.80483	17.78440
	B->S (FR)	0.27742	1.81350	17.91380
	CON->S (FR)	0.04546	0.96242	12.39400
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.26240	1.70499	15.06860
	B->S (FR)	0.26227	1.71418	15.18690
	CON->S (FR)	0.04935	0.99139	11.78520

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)	0.31215	1.88506	18.33360
	B->S (RF)	0.31603	1.88440	18.50870
	CON->S (RF)	0.02928	0.66988	8.80503
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.29717	1.73240	14.84260
	B->S (RF)	0.30114	1.73430	15.03490
	CON->S (RF)	0.03240	0.70395	8.68717

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	0.00250	0.00238	0.00239
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00222	0.00219
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00221	0.00207	0.00213
	B	0.00000	0.00000	0.00000
	B	0.00204	0.00192	0.00188

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	0.00349	0.00337	0.00338
	B	0.00000	0.00000	0.00000
	B	0.00363	0.00363	0.00364
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00320	0.00307	0.00316
	B	0.00000	0.00000	0.00000
	B	0.00334	0.00332	0.00338

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	0.00250	0.00238	0.00239
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00222	0.00217
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00221	0.00207	0.00211
	B	0.00000	0.00000	0.00000
	B	0.00204	0.00191	0.00187

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	0.00349	0.00337	0.00336
	B	0.00000	0.00000	0.00000
	B	0.00363	0.00363	0.00364
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00320	0.00306	0.00307
	B	0.00000	0.00000	0.00000
	B	0.00334	0.00331	0.00333

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	0.00349	0.00338	0.00339
	B	0.00000	0.00000	0.00000
	B	0.00364	0.00363	0.00359
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00320	0.00307	0.00315
	B	0.00000	0.00000	0.00000
	B	0.00335	0.00332	0.00326

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	0.00250	0.00239	0.00243
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00222	0.00220
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00221	0.00207	0.00213
	B	0.00000	0.00000	0.00000
	B	0.00204	0.00192	0.00188

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)	0.38547	0.36591	0.09675
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.38551	0.36595	0.09678

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)	0.38538	0.36521	0.09393
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.38541	0.36524	0.09397

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00274	0.00284	0.68468
sky130_osu_sc_12T_ms__and2_2	0.00273	0.00284	1.38068
sky130_osu_sc_12T_ms__and2_4	0.00273	0.00284	2.69448
sky130_osu_sc_12T_ms__and2_6	0.00277	0.00283	3.93422
sky130_osu_sc_12T_ms__and2_8	0.00274	0.00284	5.16648
sky130_osu_sc_12T_ms__and2_l	0.00210	0.00216	0.50265

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.00881	0.01404
sky130_osu_sc_12T_ms__and2_2	0.00000	0.01405	0.01423
sky130_osu_sc_12T_ms__and2_4	0.00000	0.02454	0.02791
sky130_osu_sc_12T_ms__and2_6	0.00000	0.03503	0.04177
sky130_osu_sc_12T_ms__and2_8	0.00000	0.04551	0.05563
sky130_osu_sc_12T_ms__and2_l	0.00000	0.10481	0.16766

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)	0.12869	0.92051	8.17330
	B->Y (RR)	0.13594	0.93244	8.38851
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.14549	0.84389	8.52959
	B->Y (RR)	0.15277	0.84810	8.70498
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.20002	0.84754	9.01619
	B->Y (RR)	0.20721	0.84445	9.17064
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.25548	0.88574	9.28228
	B->Y (RR)	0.26220	0.88003	9.40047
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.30810	0.93524	9.59459
	B->Y (RR)	0.31542	0.92964	9.68744
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.13101	0.96801	7.95253
	B->Y (RR)	0.13811	0.97552	8.13542

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)	0.11811	0.75895	6.26994
	B->Y (FF)	0.12240	0.77328	6.39049
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.14036	0.74554	6.66887
	B->Y (FF)	0.14357	0.75479	6.77941
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.20084	0.79006	7.25083
	B->Y (FF)	0.20106	0.79207	7.31626
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.26380	0.84845	7.59641
	B->Y (FF)	0.26037	0.84651	7.65689
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.32280	0.90941	7.89800
	B->Y (FF)	0.31648	0.90332	7.93382
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.11597	0.75907	5.71631
	B->Y (FF)	0.12473	0.77715	5.79849

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	0.00177	0.00154	0.00194
	B	0.00000	0.00000	0.00000
	B	0.00181	0.00156	0.00169
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00323	0.00315	0.00351
	B	0.00000	0.00000	0.00000
	B	0.00327	0.00319	0.00332
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00658	0.00674	0.00717
	B	0.00000	0.00000	0.00000
	B	0.00661	0.00682	0.00719
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00995	0.01015	0.01111
	B	0.00000	0.00000	0.00000
	B	0.00996	0.01042	0.01097
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01325	0.01382	0.01463
	B	0.00000	0.00000	0.00000
	B	0.01333	0.01398	0.01445
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00137	0.00122	0.00188
	B	0.00000	0.00000	0.00000
	B	0.00140	0.00123	0.00155

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	0.00434	0.00423	0.00476
	B	0.00000	0.00000	0.00000
	B	0.00490	0.00477	0.00523
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00542	0.00555	0.00605
	B	0.00000	0.00000	0.00000
	B	0.00599	0.00607	0.00651
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00811	0.00870	0.00927
	B	0.00000	0.00000	0.00000
	B	0.00869	0.00920	0.00968
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01089	0.01195	0.01260
	B	0.00000	0.00000	0.00000
	B	0.01146	0.01241	0.01296
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01351	0.01500	0.01582
	B	0.00000	0.00000	0.00000
	B	0.01412	0.01543	0.01612
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00330	0.00322	0.00425
	B	0.00000	0.00000	0.00000
	B	0.00370	0.00361	0.00456

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)	-0.00143	-0.00144	-0.00145
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00143	-0.00144	-0.00145
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00143	-0.00143	-0.00145
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00144	-0.00145	-0.00146
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00143	-0.00143	-0.00145
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00101	-0.00101	-0.00102

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)	0.00144	0.00148	0.00145
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00145	0.00148	0.00145
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00145	0.00148	0.00145
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00147	0.00148	0.00147
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00145	0.00146	0.00145
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00103	0.00105	0.00103

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)	-0.00136	-0.00137	-0.00136
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00136	-0.00137	-0.00136
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00136	-0.00137	-0.00136
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00136	-0.00136	-0.00136
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00136	-0.00136	-0.00136
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00096	-0.00097	-0.00097

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)	0.00137	0.00139	0.00136
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00137	0.00138	0.00137
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00137	0.00137	0.00137
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00137	0.00137	0.00137
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00137	0.00137	0.00137
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00097	0.00098	0.00097

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__aoi21_l	0.00248	0.00267	0.00264	0.29477

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00368	0.00730

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)	0.15890	1.30521	12.22880
	A1->Y (FR)	0.13065	1.21205	11.70840
	B0->Y (FR)	0.12377	1.25061	12.20080

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)	0.06866	0.68608	7.15029
	A1->Y (RF)	0.06309	0.68926	7.38405
	B0->Y (RF)	0.03925	0.61181	6.90713

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	0.00349	0.00345	0.00345
	A1	0.00000	0.00000	0.00000
	A1	0.00296	0.00290	0.00288
	B0	0.00290	0.00283	0.00286

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	0.00077	0.00066	0.00062
	A1	0.00000	0.00000	0.00000
	A1	0.00078	0.00066	0.00062
	B0	-0.00022	-0.00024	-0.00027

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)	-0.00106	-0.00115	-0.00115
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00117	-0.00118	-0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00118	-0.00118	-0.00118

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)	0.00114	0.00116	0.00115
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00117	0.00118	0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00119	0.00118	0.00118

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)	-0.00106	-0.00116	-0.00115
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00117	-0.00118	-0.00118
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00130	-0.00131	-0.00131

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)	0.00115	0.00117	0.00115
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00118	0.00119	0.00118
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00132	0.00135	0.00132

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)	-0.00061	-0.00063	-0.00062

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00070	0.00070	0.00064

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_l	0.00248	0.00267	0.00280	0.00260	0.28756

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.00419	0.01386

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)	0.20257	1.34714	12.13530
	A1->Y (FR)	0.18149	1.31872	12.07720
	B0->Y (FR)	0.13067	1.24433	12.02840
	B1->Y (FR)	0.15218	1.27166	12.09590

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)	0.08779	0.70191	7.09849
	A1->Y (RF)	0.08211	0.70558	7.32985
	B0->Y (RF)	0.05076	0.66788	7.28362
	B1->Y (RF)	0.05679	0.66403	7.05475

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	0.00433	0.00428	0.00427
	A1	0.00379	0.00372	0.00371
	B0	0.00310	0.00301	0.00303
	B1	0.00364	0.00357	0.00360

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00150	0.00140	0.00133
	A1	0.00151	0.00140	0.00134
	B0	-0.00011	-0.00012	-0.00015
	B1	-0.00010	-0.00012	-0.00015

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)	-0.00108	-0.00115	-0.00115
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00117	-0.00118	-0.00118
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00117	-0.00118	-0.00117
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00118	-0.00118	-0.00117

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)	0.00114	0.00115	0.00115
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00117	0.00119	0.00118
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00119	0.00118	0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00119	0.00118	0.00118

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)	-0.00109	-0.00116	-0.00115
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00118	-0.00118	-0.00118
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00129	-0.00130	-0.00131
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00129	-0.00130	-0.00131

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)	0.00115	0.00116	0.00115
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00118	0.00119	0.00118
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00131	0.00134	0.00131
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00131	0.00134	0.00131

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)	-0.00062	-0.00063	-0.00061
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00061	-0.00062	-0.00061
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00136	-0.00136	-0.00138
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00136	-0.00136	-0.00138

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)	0.00073	0.00074	0.00064
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00061	0.00062	0.00061
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00138	0.00138	0.00138
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00138	0.00138	0.00138

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)	-0.00063	-0.00063	-0.00062
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00062	-0.00062	-0.00062
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00124	-0.00125	-0.00125
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00124	-0.00125	-0.00125

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)	0.00074	0.00074	0.00065
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00062	0.00062	0.00062
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00126	0.00125	0.00125
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00126	0.00125	0.00125

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00285	0.64500
sky130_osu_sc_12T_ms__buf_2	0.00285	1.32824
sky130_osu_sc_12T_ms__buf_4	0.00285	2.65786
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00285	5.17280
sky130_osu_sc_12T_ms__buf_l	0.00214	0.50096

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00711	0.00711
sky130_osu_sc_12T_ms__buf_2	0.00000	0.01067	0.01404
sky130_osu_sc_12T_ms__buf_4	0.00000	0.01778	0.02791
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.03201	0.05563
sky130_osu_sc_12T_ms__buf_l	0.00000	0.08387	0.08387

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)**	0.09396	0.88681	8.07729
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.09858	0.78321	8.32352
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.13167	0.76146	8.82134
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.19812	0.80340	9.34169
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.09582	0.91838	7.82469

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)**	0.11213	0.73719	5.98682
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.13431	0.73014	6.47981
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.19525	0.78151	7.16222
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.31674	0.90232	7.88102
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.11307	0.75211	5.65594

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	0.00171	0.00141	0.00177
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00316	0.00300	0.00329
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00652	0.00663	0.00707
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01317	0.01375	0.01466
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00133	0.00112	0.00174

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	0.00426	0.00409	0.00459
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00533	0.00534	0.00581
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00804	0.00848	0.00895
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01347	0.01471	0.01537
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00329	0.00320	0.00422

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
	-0.00036	-0.00036	-0.00036

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
	0.00036	0.00036	0.00036

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffnr_1	0.00259	0.00260	0.00844	0.67977	0.68181
sky130_osu_sc_12T_ms__dffnr_l	0.00259	0.00260	0.00844	0.50463	0.50427

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.06600	0.13527
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.14276	0.21203

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)	0.69626	2.21986	17.33640
	QN->Q (FR)	0.04920	1.02643	13.07420
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.67859	2.28981	16.86010
	QN->Q (FR)	0.05191	1.04016	12.29650

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)	0.43960	2.04999	18.95530
	QN->Q (RF)	0.03231	0.70986	9.25044
	RN->Q (FF)	0.39095	2.04499	19.27530
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.44041	2.19805	18.83930
	QN->Q (RF)	0.03479	0.73771	9.05971
	RN->Q (FF)	0.39190	2.19300	19.15490

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)	0.37661	1.24153	9.54513
	RN->QN (FR)	0.32752	1.23596	9.86473
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.36953	1.28538	9.35035
	RN->QN (FR)	0.32066	1.27980	9.66504

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)**	0.61046	1.32743	7.02691
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.59251	1.33786	7.00667

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)	-0.14521	-0.38856	-2.67672
	setup	CK (F)	0.30589	0.41827	2.71878
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14341	-0.38854	-2.67557
	setup	CK (F)	0.30725	0.41857	2.71894

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)	-0.15158	-0.19233	-1.07425
	setup	CK (F)	0.32549	0.34199	1.86722
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14899	-0.19114	-1.07422
	setup	CK (F)	0.32558	0.34149	1.88082

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)	-0.14521	-0.38856	-2.67672
	setup	CK (F)	0.30589	0.41827	2.71878
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14341	-0.38854	-2.67557
	setup	CK (F)	0.30725	0.41857	2.71894

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)	-0.15158	-0.19233	-1.07425
	setup	CK (F)	0.32549	0.34199	1.86722
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14899	-0.19114	-1.07422
	setup	CK (F)	0.32558	0.34149	1.88082

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)	0.25345	0.24580	0.10565
	removal	CK (F)	-0.15036	-0.15515	-0.08407
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.25531	0.24682	0.10946
	removal	CK (F)	-0.15036	-0.15515	-0.08407

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)	0.25345	0.24580	0.10565
	removal	CK (F)	-0.15036	-0.15515	-0.08407
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.25531	0.24682	0.10946
	removal	CK (F)	-0.15036	-0.15515	-0.08407

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 ()	0.24484	0.53150	13.33370
	min_pulse_width	RN ()	0.24581	0.53371	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.23787	0.52929	13.33370
	min_pulse_width	RN ()	0.23787	0.52929	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 ()	0.29875	0.47852	13.33370
	min_pulse_width	CK ()	0.38144	0.47852	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.30234	0.47852	13.33370
	min_pulse_width	CK ()	0.38144	0.47852	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 ()	0.29317	0.51384	13.33370
	min_pulse_width	CK ()	0.22590	0.52929	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.28424	0.51163	13.33370
	min_pulse_width	CK ()	0.22015	0.52488	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	0.00820	0.00787	0.00406
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00777	0.00750	0.00532

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	0.00809	0.00764	0.00527
	RN	-0.00059	-0.02527	-0.30972
	RN	0.01058	0.01022	0.00731
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00764	0.00727	0.00619
	RN	-0.00059	-0.02113	-0.22992
	RN	0.01013	0.00984	0.00829

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	0.00809	0.00765	0.00523
	RN	-0.00059	-0.02531	-0.31065
	RN	0.01058	0.01022	0.00732
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00764	0.00727	0.00618
	RN	-0.00059	-0.02112	-0.22976
	RN	0.01013	0.00984	0.00824

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	0.00818	0.00785	0.00399
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00775	0.00748	0.00528

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)	0.00520	0.00495	0.00495
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00171	0.00150	0.00156
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00116	-0.00130	-0.00131
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)	0.00520	0.00495	0.00495
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00171	0.00150	0.00156
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00116	-0.00130	-0.00131

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)	0.00791	0.00777	0.00773
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00425	0.00413	0.00414
	!CK	0.00000	0.00000	0.00000
	!CK	0.00130	0.00131	0.00131
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)	0.00791	0.00777	0.00773
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00425	0.00413	0.00414
	!CK	0.00000	0.00000	0.00000
	!CK	0.00130	0.00131	0.00131

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)	0.00534	0.00492	0.00519
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00172	0.00144	0.00173
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00535	0.00492	0.00519
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00172	0.00144	0.00173

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)	0.00805	0.00774	0.00799
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00428	0.00408	0.00452
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00806	0.00775	0.00799
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00428	0.00408	0.00452

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)	-0.00012	-0.00050	-0.00030
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00583	0.00496	0.00551
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00170	0.00100	0.00162
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00675	0.00613	0.00619
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00010	-0.00050	-0.00026
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00012	-0.00050	-0.00030
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00583	0.00496	0.00552
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00170	0.00100	0.00162
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00675	0.00613	0.00619
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00010	-0.00050	-0.00026

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)	0.00681	0.00651	0.00690
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00867	0.00821	0.00910
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00712	0.00684	0.00723
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00681	0.00651	0.00690
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00867	0.00821	0.00910
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00712	0.00685	0.00723

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00259	0.00260	0.00822	0.68634	0.68492
sky130_osu_sc_12T_ms__dffr_l	0.00259	0.00260	0.00820	0.49996	0.50485

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.06600	0.13541
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.14276	0.21218

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)	0.56236	1.97059	15.96250
	QN->Q (FR)	0.04920	1.02999	13.14630
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.54440	2.02667	15.20650
	QN->Q (FR)	0.05191	1.03649	12.23050

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)	0.54785	2.10741	18.33690
	QN->Q (RF)	0.03230	0.71182	9.28720
	RN->Q (FF)	0.39158	2.05400	19.43290
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.54845	2.24145	17.93400
	QN->Q (RF)	0.03479	0.73563	9.02303
	RN->Q (FF)	0.39262	2.18549	19.00350

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)	0.48477	1.29400	8.80550
	RN->QN (FR)	0.32800	1.23878	9.90038
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.47756	1.33712	8.60158
	RN->QN (FR)	0.32111	1.28141	9.67537

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)**	0.47668	1.07220	5.52225
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.45843	1.08152	5.48713

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)	-0.09061	-0.12114	-0.66928
	setup	CK (R)	0.42776	0.43126	1.71790
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.08895	-0.12205	-0.67158
	setup	CK (R)	0.43159	0.43336	1.73308

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)	-0.22807	-0.54049	-5.06756
	setup	CK (R)	0.27172	0.55821	5.10730
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.22693	-0.53804	-5.06824
	setup	CK (R)	0.27171	0.55821	5.10729

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)	-0.09061	-0.12114	-0.66928
	setup	CK (R)	0.42776	0.43126	1.71790
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.08895	-0.12205	-0.67158
	setup	CK (R)	0.43159	0.43336	1.73308

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)	-0.22807	-0.54049	-5.06756
	setup	CK (R)	0.27172	0.55821	5.10730
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.22693	-0.53804	-5.06824
	setup	CK (R)	0.27171	0.55821	5.10729

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)	0.37803	0.38225	1.52134
	removal	CK (R)	-0.05854	-0.06591	-0.07407
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.37849	0.38612	1.53252
	removal	CK (R)	-0.05498	-0.06591	-0.07407

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)	0.37803	0.38225	1.52134
	removal	CK (R)	-0.05854	-0.06591	-0.07407
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.37849	0.38612	1.53252
	removal	CK (R)	-0.05498	-0.06591	-0.07407

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 ()	0.24782	0.53371	13.33370
	min_pulse_width	RN ()	0.24684	0.53150	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.24187	0.52929	13.33370
	min_pulse_width	RN ()	0.24187	0.52929	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 ()	0.24122	0.47852	13.33370
	min_pulse_width	CK ()	0.30953	0.47852	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.22684	0.47852	13.33370
	min_pulse_width	CK ()	0.30234	0.47852	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 ()	0.55882	0.60215	13.33370
	min_pulse_width	CK ()	0.22325	0.47852	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.55831	0.60657	13.33370
	min_pulse_width	CK ()	0.22325	0.47852	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	0.00440	0.00380	0.00025
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00396	0.00343	0.00155

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	0.00488	0.00443	0.00159
	RN	-0.00059	-0.02541	-0.31271
	RN	0.01099	0.01063	0.00770
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00443	0.00406	0.00257
	RN	-0.00059	-0.02101	-0.22779
	RN	0.01053	0.01025	0.00865

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	0.00488	0.00443	0.00164
	RN	-0.00059	-0.02538	-0.31207
	RN	0.01099	0.01063	0.00770
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00443	0.00406	0.00255
	RN	-0.00059	-0.02114	-0.23002
	RN	0.01054	0.01025	0.00863

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	0.00438	0.00378	0.00022
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00394	0.00341	0.00150

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	-0.00101	-0.00116	-0.00117
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00527	0.00502	0.00501
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00210	0.00189	0.00195
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00101	-0.00116	-0.00117
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00527	0.00502	0.00501
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00210	0.00189	0.00195

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	0.00116	0.00117	0.00117
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00784	0.00770	0.00766
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00386	0.00375	0.00376
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00116	0.00117	0.00117
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00784	0.00770	0.00766
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00386	0.00375	0.00376

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)	0.00172	0.00144	0.00173
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00506	0.00463	0.00491
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)	0.00172	0.00144	0.00173
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00506	0.00464	0.00491

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)	0.00427	0.00408	0.00452
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00834	0.00803	0.00828
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)	0.00427	0.00408	0.00452
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00834	0.00803	0.00828

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)	-0.00021	-0.00060	-0.00038
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00268	0.00210	0.00213
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00026	-0.00067	-0.00041
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00021	-0.00060	-0.00038
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00268	0.00210	0.00213
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00026	-0.00067	-0.00041

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)	0.00670	0.00642	0.00681
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01329	0.01277	0.01283
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00993	0.00962	0.00980
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01309	0.01253	0.01338
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00707	0.00679	0.00721
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00670	0.00642	0.00681
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01329	0.01277	0.01283
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00993	0.00963	0.00980
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01309	0.01253	0.01338
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00707	0.00679	0.00721

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ms__dffsr_1	0.00255	0.00262	0.00612	0.00839	0.70467	0.70492
sky130_osu_sc_12T_ms__dffsr_l	0.00255	0.00262	0.00612	0.00839	0.49738	0.50444

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.02682	0.03645
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.10358	0.11321

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)	0.60155	2.02641	16.32480
	QN->Q (FR)	0.04671	1.00226	12.92660
	RN->Q (RR)	0.48778	1.92583	16.42760
	SN->Q (FR)	0.45969	1.97426	18.08130
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.59220	2.08610	15.32630
	QN->Q (FR)	0.05181	1.03386	12.18690
	RN->Q (RR)	0.47906	1.98700	15.43000
	SN->Q (FR)	0.45290	2.03553	17.04760

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)	0.63775	2.20308	18.57180
	QN->Q (RF)	0.03208	0.71667	9.39842
	RN->Q (FF)	0.41498	2.07666	19.67230
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.63912	2.33514	17.95780
	QN->Q (RF)	0.03461	0.73378	8.99655
	RN->Q (FF)	0.41800	2.21090	19.04610

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)	0.57320	1.38651	8.92248
	RN->QN (FR)	0.35206	1.26009	10.02460
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.56615	1.43482	8.71312
	RN->QN (FR)	0.34652	1.31045	9.79853

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)	0.52016	1.13336	5.81802
	RN->QN (RF)	0.40665	1.03511	5.91778
	SN->QN (FF)	0.38254	1.08652	7.56852
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.50849	1.14563	5.67729
	RN->QN (RF)	0.39512	1.04820	5.77445
	SN->QN (FF)	0.36934	1.09660	7.38889

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)	-0.10808	-0.13931	-0.80299
	setup	CK (R)	0.44790	0.44348	1.70370
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.10948	-0.14096	-0.80413
	setup	CK (R)	0.44868	0.44395	1.71464

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)	-0.26614	-0.56971	-5.31099
	setup	CK (R)	0.32645	0.59033	5.34224
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.26647	-0.56936	-5.31379
	setup	CK (R)	0.32643	0.59033	5.34219

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)	-0.10808	-0.13931	-0.80299
	setup	CK (R)	0.44790	0.44348	1.70370
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.10948	-0.14096	-0.80413
	setup	CK (R)	0.44868	0.44395	1.71464

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)	-0.26614	-0.56971	-5.31099
	setup	CK (R)	0.32645	0.59033	5.34224
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.26647	-0.56936	-5.31379
	setup	CK (R)	0.32643	0.59033	5.34219

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)	0.36005	0.36065	1.45694
	removal	CK (R)	-0.04613	-0.05740	-0.13559
	hold	SN (R)	-0.37272	-0.60609	-4.25662
	setup	SN (R)	0.40159	0.65348	6.24911
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.36060	0.36212	1.46047
	removal	CK (R)	-0.04613	-0.05740	-0.13559
	hold	SN (R)	-0.35299	-0.58686	-4.17060
	setup	SN (R)	0.39875	0.63743	6.10977

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)	0.36005	0.36065	1.45694
	removal	CK (R)	-0.04613	-0.05740	-0.13559
	hold	SN (R)	-0.37283	-0.60609	-4.25662
	hold	SN (R)	-0.37272	-0.60670	-4.26295
	setup	SN (R)	0.40042	0.65073	6.12628
	setup	SN (R)	0.40159	0.65348	6.24911
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.36060	0.36212	1.46047
	removal	CK (R)	-0.04613	-0.05740	-0.13559
	hold	SN (R)	-0.35684	-0.58686	-4.17060
	hold	SN (R)	-0.35299	-0.58888	-4.18554
	setup	SN (R)	0.39875	0.63198	6.04197
	setup	SN (R)	0.38069	0.63743	6.10977

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 ()	0.27340	0.55358	13.33370
	min_pulse_width	RN ()	0.28385	0.55358	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.27130	0.54916	13.33370
	min_pulse_width	RN ()	0.27752	0.54916	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)	0.06218	0.09335	1.85953
	removal	CK (R)	-0.02095	-0.05862	-0.57843
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.06229	0.09331	1.70944
	removal	CK (R)	-0.02095	-0.05862	-0.57843

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)	0.06218	0.09335	1.85953
	removal	CK (R)	-0.02095	-0.05862	-0.57843
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.06229	0.09331	1.70944
	removal	CK (R)	-0.02095	-0.05862	-0.57843

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 ()	0.36788	0.64851	13.33370
	min_pulse_width	SN ()	0.37651	0.65072	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.36411	0.63306	13.33370
	min_pulse_width	SN ()	0.35812	0.63527	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 ()	0.26998	0.47852	13.33370
	min_pulse_width	CK ()	0.33830	0.47852	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.25920	0.47852	13.33370
	min_pulse_width	CK ()	0.33470	0.47852	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 ()	0.58041	0.61540	13.33370
	min_pulse_width	CK ()	0.28662	0.51605	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.58015	0.61760	13.33370
	min_pulse_width	CK ()	0.28662	0.51605	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	0.00535	0.00479	0.00106
	RN	0.00976	0.00931	0.00520
	SN	-0.00059	-0.02582	-0.32106
	SN	0.01071	0.01030	0.00613
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00495	0.00445	0.00248
	RN	0.00934	0.00897	0.00674
	SN	-0.00059	-0.02095	-0.22662
	SN	0.01030	0.00997	0.00766

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	0.00564	0.00531	0.00330
	RN	-0.00059	-0.02582	-0.32106
	RN	0.01156	0.01125	0.00914
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00521	0.00488	0.00342
	RN	-0.00059	-0.02095	-0.22662
	RN	0.01112	0.01081	0.00926

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	0.00564	0.00531	0.00327
	RN	-0.00059	-0.02582	-0.32118
	RN	0.01156	0.01125	0.00909
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00521	0.00488	0.00342
	RN	-0.00059	-0.02113	-0.22983
	RN	0.01112	0.01081	0.00923

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	0.00533	0.00476	0.00080
	RN	0.00974	0.00929	0.00522
	SN	-0.00059	-0.02582	-0.32116
	SN	0.01069	0.01028	0.00616
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00492	0.00443	0.00249
	RN	0.00932	0.00895	0.00673
	SN	-0.00059	-0.02113	-0.22982
	SN	0.01028	0.00995	0.00756

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	-0.00114	-0.00117	-0.00117
	(!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)	0.00654	0.00632	0.00632
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00227	0.00207	0.00210
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00225	0.00205	0.00210
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00228	0.00208	0.00212
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00114	-0.00117	-0.00117
	(!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)	0.00654	0.00632	0.00632
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00227	0.00207	0.00210
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00225	0.00205	0.00210
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00228	0.00208	0.00212

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	0.00118	0.00118	0.00117
	(!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)	0.00904	0.00891	0.00878
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00424	0.00414	0.00418
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00426	0.00416	0.00419
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00422	0.00412	0.00417
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00118	0.00118	0.00117
	(!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)	0.00904	0.00891	0.00879
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00424	0.00414	0.00419
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00426	0.00416	0.00419
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00422	0.00412	0.00417

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)	0.00150	0.00122	0.00144
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00600	0.00558	0.00570
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)	0.00150	0.00123	0.00144
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00600	0.00558	0.00570

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)	0.00468	0.00450	0.00497
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00885	0.00852	0.00877
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)	0.00468	0.00450	0.00498
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00885	0.00852	0.00877

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)	-0.00304	-0.00306	-0.00307
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00314	-0.00333	-0.00332
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00299	-0.00308	-0.00308
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00143	0.00119	0.00124
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)	-0.00304	-0.00306	-0.00307
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00316	-0.00333	-0.00332
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00299	-0.00308	-0.00308
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00143	0.00119	0.00124

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)	0.00308	0.00309	0.00308
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00331	0.00333	0.00332
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00308	0.00311	0.00308
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00710	0.00694	0.00694
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)	0.00308	0.00309	0.00308
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00332	0.00333	0.00332
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00308	0.00311	0.00308
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00710	0.00694	0.00694

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)	-0.00025	-0.00065	-0.00042
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00317	0.00262	0.00265
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00313	0.00258	0.00264
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00018	-0.00059	-0.00034
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00170	0.00100	0.00157
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00025	-0.00065	-0.00042
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00317	0.00262	0.00265
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00313	0.00258	0.00264
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00018	-0.00059	-0.00034
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00170	0.00101	0.00157

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)	0.01474	0.01425	0.01431
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00683	0.00653	0.00693
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01006	0.00978	0.00995
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01008	0.00980	0.00997
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01435	0.01378	0.01451
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00707	0.00680	0.00719
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00908	0.00857	0.00950
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01475	0.01425	0.01431
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00683	0.00652	0.00693
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01006	0.00978	0.00995
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01008	0.00980	0.00997
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01435	0.01378	0.01451
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00707	0.00680	0.00719
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00908	0.00857	0.00950

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00257	0.00510	0.00831	0.68451	0.68599
sky130_osu_sc_12T_ms__dffs_l	0.00257	0.00509	0.00831	0.50070	0.50650

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.12956	0.34976
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.20632	0.42652

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)	0.38976	1.77082	15.71840
	QN->Q (FR)	0.04924	1.02606	13.09000
	SN->Q (FR)	0.30518	1.78617	16.74000
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.38479	1.84794	15.05240
	QN->Q (FR)	0.05189	1.03485	12.21590
	SN->Q (FR)	0.29887	1.85935	16.02220

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)	0.61130	2.17163	18.33360
	QN->Q (RF)	0.03216	0.70911	9.25981
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.60542	2.30189	17.99460
	QN->Q (RF)	0.03467	0.73429	9.01534

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)	0.54513	1.36178	8.87102
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.53166	1.39801	8.67356

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)	0.31580	0.88177	5.35209
	SN->QN (FF)	0.22999	0.89821	6.36488
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.30865	0.90749	5.33695
	SN->QN (FF)	0.22192	0.91994	6.30720

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)	-0.07371	-0.10375	-0.60343
	setup	CK (R)	0.27584	0.28507	1.65530
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07096	-0.10096	-0.60481
	setup	CK (R)	0.27605	0.28596	1.66508

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)	-0.23922	-0.54745	-5.13494
	setup	CK (R)	0.30466	0.57006	5.18609
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.23852	-0.54805	-5.13567
	setup	CK (R)	0.30463	0.57010	5.18611

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)	-0.07371	-0.10375	-0.60343
	setup	CK (R)	0.27584	0.28507	1.65530
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07096	-0.10096	-0.60481
	setup	CK (R)	0.27605	0.28596	1.66508

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)	-0.23922	-0.54745	-5.13494
	setup	CK (R)	0.30466	0.57006	5.18609
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.23852	-0.54805	-5.13567
	setup	CK (R)	0.30463	0.57010	5.18611

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)	0.07256	0.10156	1.35829
	removal	CK (R)	-0.02837	-0.06129	-0.54772
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.07199	0.10159	1.22859
	removal	CK (R)	-0.02837	-0.06129	-0.54772

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)	0.07256	0.10156	1.35829
	removal	CK (R)	-0.02837	-0.06129	-0.54772
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.07199	0.10159	1.22859
	removal	CK (R)	-0.02837	-0.06129	-0.54772

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 ()	0.21172	0.56241	13.33370
	min_pulse_width	SN ()	0.21597	0.56241	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.20416	0.54696	13.33370
	min_pulse_width	SN ()	0.20286	0.54916	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 ()	0.15134	0.47852	13.33370
	min_pulse_width	CK ()	0.32032	0.47852	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.14774	0.47852	13.33370
	min_pulse_width	CK ()	0.31313	0.47852	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 ()	0.40328	0.51605	13.33370
	min_pulse_width	CK ()	0.26866	0.48955	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.40544	0.51384	13.33370
	min_pulse_width	CK ()	0.26866	0.48955	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	0.00440	0.00379	0.00025
	SN	-0.00059	-0.02537	-0.31188
	SN	0.00923	0.00871	0.00561
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00396	0.00342	0.00148
	SN	-0.00059	-0.02103	-0.22813
	SN	0.00878	0.00835	0.00684

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	0.00485	0.00444	0.00168
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00441	0.00406	0.00264

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	0.00485	0.00444	0.00171
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00441	0.00406	0.00262

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	0.00438	0.00377	0.00020
	SN	-0.00059	-0.02541	-0.31254
	SN	0.00921	0.00869	0.00547
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00394	0.00340	0.00148
	SN	-0.00059	-0.02118	-0.23076
	SN	0.00876	0.00833	0.00674

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	-0.00116	-0.00119	-0.00119
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00516	0.00490	0.00486
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00208	0.00187	0.00192
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00116	-0.00119	-0.00119
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00516	0.00490	0.00486
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00208	0.00187	0.00192

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	0.00120	0.00120	0.00119
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00777	0.00762	0.00757
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00389	0.00378	0.00384
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00120	0.00120	0.00119
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00777	0.00762	0.00757
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00389	0.00378	0.00384

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)	-0.00226	-0.00227	-0.00227
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00150	0.00124	0.00157
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)	-0.00226	-0.00227	-0.00227
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00150	0.00124	0.00157

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)	0.00227	0.00230	0.00228
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00500	0.00477	0.00558
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)	0.00227	0.00230	0.00228
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00500	0.00477	0.00558

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)	-0.00021	-0.00061	-0.00039
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00021	-0.00062	-0.00037
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00156	0.00086	0.00146
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00021	-0.00060	-0.00038
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00021	-0.00062	-0.00037
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00156	0.00086	0.00147

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)	0.01323	0.01273	0.01278
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00671	0.00642	0.00681
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01296	0.01234	0.01318
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00703	0.00676	0.00717
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00860	0.00811	0.00905
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01323	0.01273	0.01278
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00671	0.00642	0.00682
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01296	0.01234	0.01318
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00703	0.00676	0.00717
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00860	0.00811	0.00905

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00272	0.00801	0.63653
sky130_osu_sc_12T_ms__dff_l	0.00272	0.00801	0.47664

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.02387	0.02936
sky130_osu_sc_12T_ms__dff_l	0.00000	0.10063	0.10612

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)	0.33880	1.14508	8.42743
sky130_osu_sc_12T_ms__dff_l	CK->Q (RR)	0.33306	1.18592	8.19989

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)	0.51337	1.06804	5.48904
sky130_osu_sc_12T_ms__dff_l	CK->Q (RF)	0.50931	1.10256	5.53606

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)	-0.07783	-0.10933	-0.68816
	setup	CK (R)	0.22932	0.24392	1.63929
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.07592	-0.10927	-0.68786
	setup	CK (R)	0.22941	0.24506	1.65780

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)	-0.22095	-0.54422	-5.15997
	setup	CK (R)	0.26609	0.56839	5.20996
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.22347	-0.54471	-5.15991
	setup	CK (R)	0.26614	0.56839	5.20996

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 ()	0.14415	0.47852	13.33370
	min_pulse_width	CK ()	0.30234	0.47852	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.14055	0.47852	13.33370
	min_pulse_width	CK ()	0.29515	0.47852	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 ()**	0.35897	0.50280	13.33370
	min_pulse_width	**CK ()**	0.21618	0.48735	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.35897	0.50280	13.33370
	min_pulse_width	**CK ()**	0.21618	0.48735	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	0.00926	0.00842	0.00884
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00836	0.00753	0.00799

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	0.00992	0.00940	0.00940
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00903	0.00850	0.00852

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	-0.00100	-0.00115	-0.00116
	!CK	0.00000	0.00000	0.00000
	!CK	0.00473	0.00446	0.00441
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00100	-0.00115	-0.00116
	!CK	0.00000	0.00000	0.00000
	!CK	0.00473	0.00447	0.00441

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	0.00115	0.00116	0.00116
	!CK	0.00000	0.00000	0.00000
	!CK	0.00808	0.00788	0.00787
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00116	0.00116	0.00116
	!CK	0.00000	0.00000	0.00000
	!CK	0.00808	0.00789	0.00787

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)	-0.00024	-0.00063	-0.00040
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00022	-0.00062	-0.00036
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00024	-0.00063	-0.00040
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00022	-0.00062	-0.00036

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)	0.00669	0.00639	0.00680
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01278	0.01228	0.01236
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01317	0.01251	0.01339
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00698	0.00671	0.00713
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00669	0.00639	0.00680
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01278	0.01228	0.01236
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01317	0.01251	0.01339
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00698	0.00671	0.00713

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00264	0.62865
sky130_osu_sc_12T_ms__inv_10	0.02342	6.39573
sky130_osu_sc_12T_ms__inv_2	0.00488	1.32033
sky130_osu_sc_12T_ms__inv_3	0.00721	1.92714
sky130_osu_sc_12T_ms__inv_4	0.00949	2.62536
sky130_osu_sc_12T_ms__inv_6	0.01421	3.92141
sky130_osu_sc_12T_ms__inv_8	0.01881	5.18943
sky130_osu_sc_12T_ms__inv_l	0.00210	0.46313

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00356	0.00693
sky130_osu_sc_12T_ms__inv_10	0.00000	0.03557	0.06931
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00711	0.01386
sky130_osu_sc_12T_ms__inv_3	0.00000	0.01067	0.02079
sky130_osu_sc_12T_ms__inv_4	0.00000	0.01423	0.02772
sky130_osu_sc_12T_ms__inv_6	0.00000	0.02134	0.04158
sky130_osu_sc_12T_ms__inv_8	0.00000	0.02845	0.05545
sky130_osu_sc_12T_ms__inv_l	0.00000	0.04194	0.08379

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)**	0.04794	0.96603	12.11120
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.04625	0.63397	12.19170
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.03417	0.81915	12.20870
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.03556	0.76175	12.16800
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.03393	0.71976	12.22070
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.03634	0.67662	12.23080
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.04075	0.64990	12.21210
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.05226	0.98175	11.44870

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)**	0.02973	0.64748	8.37745
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.03432	0.46897	8.64890
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02317	0.58188	8.57723
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.02448	0.55340	8.61896
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02369	0.52883	8.66817
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02674	0.50135	8.69642
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03031	0.48336	8.69249
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.03329	0.68383	8.31615

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	0.00215	0.00212	0.00219
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.01745	0.01747	0.01880
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00367	0.00367	0.00385
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00565	0.00562	0.00594
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00717	0.00682	0.00761
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01063	0.01074	0.01138
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01406	0.01416	0.01510
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00170	0.00156	0.00177

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	-0.00029	-0.00032	-0.00032
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00575	-0.00568	-0.00487
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00105	-0.00108	-0.00103
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00134	-0.00141	-0.00128
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00215	-0.00220	-0.00199
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00329	-0.00332	-0.00296
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00448	-0.00453	-0.00392
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00021	-0.00024	-0.00024

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ms__mux2_1	0.02796	0.02784	0.00545	0.02389

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00718	0.00718

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)	-	0.02359	0.35036	3.02403
	A1->Y (RR)	-	0.02872	0.35336	3.03010
	S0->Y (RR)	(!A0 * A1)	0.07481	0.36624	1.41466
	S0->Y (FR)	(A0 * !A1)	0.04972	0.44712	3.19474

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)	-	0.02524	0.30005	2.51460
	A1->Y (FF)	-	0.02160	0.29653	2.51062
	S0->Y (FF)	(!A0 * A1)	0.10965	0.46938	2.46912
	S0->Y (RF)	(A0 * !A1)	0.03213	0.31502	1.99371

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	-	-0.00212	-0.00212	-0.00213
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00140	-0.00140	-0.00141
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00290	0.00270	0.00326
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00128	-0.00161	-0.00124

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	-	0.00212	0.00212	0.00213
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00140	0.00140	0.00141
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00045	0.00012	0.00051
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00572	0.00551	0.00601

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)	-0.00054	-0.00054	-0.00054

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)	0.00054	0.00054	0.00054

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)	-0.00064	-0.00064	-0.00064

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)	0.00064	0.00064	0.00064

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)	-0.00043	-0.00077	-0.00037
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00042	-0.00076	-0.00037

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)	0.00444	0.00422	0.00475
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00418	0.00397	0.00454

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00263	0.00262	0.62515
sky130_osu_sc_12T_ms__nand2_l	0.00205	0.00208	0.46160

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00357	0.01386
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.04195	0.16757

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)	0.05006	0.96758	12.10630
	B->Y (FR)	0.05653	0.94339	11.72370
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.05275	0.98345	11.44600
	B->Y (FR)	0.06192	0.99422	11.43820

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)	0.04799	0.85517	10.61940
	B->Y (RF)	0.05421	0.85371	10.43700
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.05268	0.91182	10.51950
	B->Y (RF)	0.05846	0.90833	10.30170

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	0.00226	0.00223	0.00230
	B	0.00000	0.00000	0.00000
	B	0.00282	0.00277	0.00285
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00170	0.00161	0.00176
	B	0.00000	0.00000	0.00000
	B	0.00210	0.00207	0.00216

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	-0.00016	-0.00021	-0.00021
	B	0.00000	0.00000	0.00000
	B	-0.00015	-0.00019	-0.00020
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00010	-0.00014	-0.00014
	B	0.00000	0.00000	0.00000
	B	-0.00010	-0.00013	-0.00014

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)	-0.00137	-0.00138	-0.00139
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00097	-0.00098	-0.00099

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)	0.00139	0.00142	0.00139
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00099	0.00101	0.00099

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)	-0.00127	-0.00128	-0.00127
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00091	-0.00092	-0.00092

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)	0.00128	0.00128	0.00127
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00092	0.00092	0.00092

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00259	0.00286	0.31584
sky130_osu_sc_12T_ms__nor2_l	0.00197	0.00218	0.23303

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00287	0.00693
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.02872	0.08379

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)	0.11624	1.22568	12.16310
	B->Y (FR)	0.09656	1.18477	12.03250
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.11876	1.26715	11.63040
	B->Y (FR)	0.10370	1.20945	11.22760

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)	0.03736	0.55791	6.34778
	B->Y (RF)	0.03150	0.55025	6.33133
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.03956	0.57937	6.26951
	B->Y (RF)	0.03456	0.57293	6.25519

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	0.00288	0.00283	0.00283
	B	0.00000	0.00000	0.00000
	B	0.00237	0.00230	0.00234
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00210	0.00206	0.00206
	B	0.00000	0.00000	0.00000
	B	0.00178	0.00173	0.00182

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	0.00034	0.00023	0.00022
	B	0.00000	0.00000	0.00000
	B	-0.00023	-0.00025	-0.00028
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00026	0.00019	0.00018
	B	0.00000	0.00000	0.00000
	B	-0.00014	-0.00016	-0.00018

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)	-0.00101	-0.00117	-0.00117
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00066	-0.00079	-0.00080

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)	0.00117	0.00117	0.00117
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00080	0.00081	0.00081

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)	-0.00062	-0.00063	-0.00062
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00043	-0.00044	-0.00043

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00067	0.00063
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00046	0.00046	0.00044

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00262	0.00271	0.00234	0.31645

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.03293	0.09072

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)	0.13290	1.22664	12.10780
	A1->Y (FR)	0.15800	1.27396	12.23990
	B0->Y (FR)	0.06631	0.87194	9.40747

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)	0.06479	0.70536	7.46464
	A1->Y (RF)	0.07537	0.70481	7.38960
	B0->Y (RF)	0.05179	0.70840	7.80831

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	0.00318	0.00310	0.00313
	A1	0.00000	0.00000	0.00000
	A1	0.00374	0.00367	0.00366
	B0	0.00254	0.00249	0.00260

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	0.00021	0.00018	0.00014
	A1	0.00000	0.00000	0.00000
	A1	0.00080	0.00070	0.00067
	B0	0.00102	0.00097	0.00095

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)	-0.00063	-0.00063	-0.00062
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00117	-0.00119	-0.00119
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00121	-0.00122	-0.00122

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)	0.00066	0.00067	0.00064
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00118	0.00119	0.00119
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00122	0.00122	0.00122

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)	-0.00097	-0.00112	-0.00113
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00115	-0.00118	-0.00118
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00120	-0.00121	-0.00120

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)	0.00112	0.00113	0.00113
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00117	0.00118	0.00118
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00120	0.00121	0.00120

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)	-0.00102	-0.00103	-0.00106

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)	0.00106	0.00107	0.00106

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00245	0.00258	0.00277	0.00273	0.32658

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00431	0.01386

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)	0.16867	1.27637	12.24670
	A1->Y (FR)	0.14776	1.23473	12.12720
	B0->Y (FR)	0.10139	1.18503	12.07990
	B1->Y (FR)	0.12452	1.22732	12.20210

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)	0.09772	0.75419	7.63653
	A1->Y (RF)	0.08173	0.73364	7.59528
	B0->Y (RF)	0.06906	0.73527	7.93798
	B1->Y (RF)	0.08603	0.75374	7.99109

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	0.00471	0.00465	0.00462
	A1	0.00414	0.00407	0.00408
	B0	0.00304	0.00298	0.00301
	B1	0.00364	0.00358	0.00356

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00116	0.00107	0.00103
	A1	0.00061	0.00058	0.00053
	B0	0.00060	0.00056	0.00052
	B1	0.00116	0.00105	0.00102

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)	-0.00099	-0.00114	-0.00114
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00099	-0.00114	-0.00114
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00111	-0.00114	-0.00114
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00116	-0.00117	-0.00116

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)	0.00114	0.00114	0.00114
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00114	0.00114	0.00114
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00114	0.00114	0.00114
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00116	0.00119	0.00116

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)	-0.00060	-0.00061	-0.00060
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00061	-0.00061	-0.00060
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00111	-0.00113	-0.00113
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00116	-0.00116	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00064	0.00065	0.00062
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00064	0.00065	0.00062
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00112	0.00113	0.00113
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00116	0.00118	0.00116

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)	-0.00061	-0.00062	-0.00061
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00061	-0.00062	-0.00061
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00133	-0.00135	-0.00135
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00132	-0.00134	-0.00137

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)	0.00065	0.00066	0.00062
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00065	0.00065	0.00062
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00135	0.00135	0.00135
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00138	0.00138	0.00138

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)	-0.00098	-0.00113	-0.00113
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00098	-0.00113	-0.00113
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00136	-0.00139	-0.00138
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00135	-0.00136	-0.00140

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)	0.00113	0.00114	0.00113
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00113	0.00114	0.00113
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00138	0.00139	0.00138
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00140	0.00143	0.00141

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00294	0.00271	0.64753
sky130_osu_sc_12T_ms__or2_2	0.00294	0.00271	1.32774
sky130_osu_sc_12T_ms__or2_4	0.00294	0.00270	2.66629
sky130_osu_sc_12T_ms__or2_8	0.00293	0.00271	5.21679
sky130_osu_sc_12T_ms__or2_l	0.00222	0.00208	0.48260

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00474	0.00730
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00661	0.01423
sky130_osu_sc_12T_ms__or2_4	0.00000	0.01035	0.02809
sky130_osu_sc_12T_ms__or2_8	0.00000	0.01783	0.05581
sky130_osu_sc_12T_ms__or2_l	0.00000	0.04974	0.08396

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)	0.10583	0.92280	8.32048
	B->Y (RR)	0.09596	0.89344	8.13646
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.11146	0.81337	8.50749
	B->Y (RR)	0.10103	0.79003	8.35698
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.14466	0.78760	9.00964
	B->Y (RR)	0.13401	0.76877	8.88551
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.21098	0.82267	9.54598
	B->Y (RR)	0.20010	0.80946	9.45496
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.10867	0.96802	8.07909
	B->Y (RR)	0.09934	0.94253	7.92325

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)	0.22736	0.88225	6.65618
	B->Y (FF)	0.19594	0.83377	6.20355
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.27770	0.90064	7.14348
	B->Y (FF)	0.24661	0.85622	6.74294
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.39944	1.01768	7.86941
	B->Y (FF)	0.36855	0.96964	7.53408
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.64180	1.28423	8.66421
	B->Y (FF)	0.61045	1.23325	8.42737
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.22968	0.90408	6.24099
	B->Y (FF)	0.20166	0.84264	5.71875

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	0.00236	0.00207	0.00226
	B	0.00000	0.00000	0.00000
	B	0.00179	0.00155	0.00191
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00383	0.00369	0.00389
	B	0.00000	0.00000	0.00000
	B	0.00324	0.00319	0.00373
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00719	0.00734	0.00768
	B	0.00000	0.00000	0.00000
	B	0.00660	0.00687	0.00737
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01386	0.01450	0.01513
	B	0.00000	0.00000	0.00000
	B	0.01326	0.01406	0.01498
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00181	0.00162	0.00189
	B	0.00000	0.00000	0.00000
	B	0.00140	0.00125	0.00178

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	0.00501	0.00486	0.00489
	B	0.00000	0.00000	0.00000
	B	0.00427	0.00421	0.00470
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00607	0.00618	0.00621
	B	0.00000	0.00000	0.00000
	B	0.00534	0.00548	0.00595
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00876	0.00930	0.00939
	B	0.00000	0.00000	0.00000
	B	0.00801	0.00856	0.00907
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01416	0.01530	0.01584
	B	0.00000	0.00000	0.00000
	B	0.01345	0.01456	0.01543
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00374	0.00363	0.00382
	B	0.00000	0.00000	0.00000
	B	0.00323	0.00322	0.00417

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)	-0.00103	-0.00118	-0.00118
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00103	-0.00118	-0.00118
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00103	-0.00118	-0.00118
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00103	-0.00118	-0.00118
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00066	-0.00079	-0.00081

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)	0.00117	0.00119	0.00118
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00117	0.00119	0.00118
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00117	0.00119	0.00118
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00117	0.00119	0.00118
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00081	0.00081	0.00081

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)	-0.00063	-0.00063	-0.00062
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00063	-0.00063	-0.00062
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00063	-0.00063	-0.00062
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00063	-0.00063	-0.00062
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00043	-0.00043	-0.00042

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00067	0.00064
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00067	0.00064
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00067	0.00067	0.00064
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00067	0.00068	0.00064
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00046	0.00046	0.00043

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00284	0.00373	0.32986
sky130_osu_sc_12T_ms__tbufi_l	0.00219	0.00287	0.23306

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00369	0.01386
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.04201	0.16757

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)	0.08877	1.17697	12.14120
	OE->Y (FR)	0.06925	0.37276	4.01296
	OE->Y (RR)	0.13626	1.11334	8.30278
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.09905	1.20660	11.22870
	OE->Y (FR)	0.06752	0.33059	4.01293
	OE->Y (RR)	0.14229	1.17109	7.89740

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)	0.04675	0.69111	7.73715
	OE->Y (FF)	0.07066	0.37517	4.01295
	OE->Y (RF)	0.04493	0.67931	7.49795
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.05195	0.72009	7.51062
	OE->Y (FF)	0.06867	0.33508	4.01293
	OE->Y (RF)	0.04909	0.70502	7.23567

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	0.00218	0.00212	0.00215
	OE	0.00000	0.00000	0.00000
	OE	0.00207	0.00178	0.00222
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00166	0.00162	0.00167
	OE	0.00000	0.00000	0.00000
	OE	0.00152	0.00131	0.00204

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	-0.00023	-0.00026	-0.00027
	OE	0.00000	0.00000	0.00000
	OE	0.00137	0.00106	0.00151
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00014	-0.00016	-0.00017
	OE	0.00000	0.00000	0.00000
	OE	0.00096	0.00073	0.00150

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)	-0.00104	-0.00105	-0.00104
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00095	-0.00096	-0.00095
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00075	-0.00075	-0.00075
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00068	-0.00070	-0.00068

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)	0.00104	0.00105	0.00104
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00098	0.00099	0.00096
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00075	0.00075	0.00075
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00071	0.00071	0.00070

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)	0.00079	0.00050	0.00093
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00070	0.00040	0.00083
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00056	0.00033	0.00110
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00048	0.00028	0.00101

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)	0.00262	0.00236	0.00288
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00267	0.00243	0.00294
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00201	0.00185	0.00291
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00203	0.00189	0.00295

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00283	0.00415	0.32385
sky130_osu_sc_12T_ms__tnbufi_l	0.00209	0.00317	0.23322

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00594	0.00711
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.06991	0.08389

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)	0.08960	1.16807	12.00840
	OE->Y (RR)	0.03535	0.28108	4.01321
	OE->Y (FR)	0.10218	1.20177	12.12390
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.09725	1.20422	11.22990
	OE->Y (RR)	0.03860	0.28088	4.01289
	OE->Y (FR)	0.10748	1.25745	11.63340

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)	0.04560	0.68676	7.67369
	OE->Y (RF)	0.03508	0.28105	4.01322
	OE->Y (FF)	0.09606	0.71988	5.13554
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.04924	0.71870	7.51101
	OE->Y (RF)	0.03806	0.28084	4.01294
	OE->Y (FF)	0.10218	0.72509	4.57326

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	0.00227	0.00220	0.00223
	OE	0.00000	0.00000	0.00000
	OE	0.00528	0.00515	0.00581
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00170	0.00166	0.00172
	OE	0.00000	0.00000	0.00000
	OE	0.00403	0.00395	0.00514

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	-0.00034	-0.00036	-0.00038
	OE	0.00000	0.00000	0.00000
	OE	0.00466	0.00452	0.00515
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00025	-0.00027	-0.00028
	OE	0.00000	0.00000	0.00000
	OE	0.00356	0.00349	0.00462

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)	-0.00085	-0.00086	-0.00086
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00077	-0.00078	-0.00077
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00058	-0.00059	-0.00059
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00052	-0.00053	-0.00052

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)	0.00085	0.00086	0.00086
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00080	0.00080	0.00078
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00058	0.00059	0.00059
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00055	0.00055	0.00054

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)	-0.00126	-0.00168	-0.00124
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00124	-0.00166	-0.00123
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00084	-0.00117	-0.00041
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00086	-0.00117	-0.00041

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)	0.00398	0.00385	0.00447
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00391	0.00377	0.00441
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00308	0.00304	0.00417
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00303	0.00298	0.00412

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xnor2_1	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_1	0.00566	0.00478	0.33323

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_1	0.00000	0.01267	0.02098

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	0.17628	1.16585	8.49166
	A->Y (FR)	!B	0.11825	1.20633	12.16110
	B->Y (RR)	A	0.14629	1.13396	8.41391
	B->Y (FR)	!A	0.13945	1.24405	12.27180

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	0.15275	0.82008	5.63471
	A->Y (RF)	!B	0.06424	0.69751	7.54753
	B->Y (FF)	A	0.13778	0.80259	5.61612
	B->Y (RF)	!A	0.07431	0.71145	7.56344

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	0.00220	0.00185	0.00222
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00555	0.00527	0.00588
	B	A	0.00000	0.00000	0.00000
	B	A	0.00116	0.00091	0.00133
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00573	0.00553	0.00611

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	0.00650	0.00618	0.00664
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00151	0.00116	0.00154
	B	A	0.00000	0.00000	0.00000
	B	A	0.00582	0.00572	0.00626
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00202	0.00164	0.00203

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00570	0.00483	0.31843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.01267	0.02152

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	0.18471	1.17578	8.43869
	A->Y (FR)	B	0.14230	1.25104	12.24690
	B->Y (RR)	!A	0.15352	1.15293	8.41551
	B->Y (FR)	A	0.15379	1.26698	12.26080

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	0.15285	0.81118	5.53068
	A->Y (RF)	B	0.06362	0.70750	7.64527
	B->Y (FF)	!A	0.14311	0.79983	5.48621
	B->Y (RF)	A	0.07070	0.70201	7.40782

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	0.00633	0.00607	0.00665
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00147	0.00093	0.00128
	B	A	0.00000	0.00000	0.00000
	B	A	0.00637	0.00617	0.00675
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00110	0.00083	0.00124

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	0.00135	0.00091	0.00127
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00673	0.00653	0.00706
	B	A	0.00000	0.00000	0.00000
	B	A	0.00136	0.00097	0.00134
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00592	0.00582	0.00637

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.14971
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	51669.00000	103338.00000
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
	-0.00109	0.00921	0.13878

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	0.89989	0.85145	0.17970