sky130_osu_sc_12T_ms_ss_1P60_100C.ccs Library

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

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.01134	0.01138	0.00874	0.81247	0.36165	0.74693
sky130_osu_sc_12T_ms__addf_l	0.01135	0.01138	0.00874	0.58059	0.36282	0.74680

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.03898	0.04406
sky130_osu_sc_12T_ms__addf_l	0.00000	0.10648	0.17764

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)	0.29442	2.53306	29.69180
	B->CO (RR)	0.29644	2.51454	29.47970
	CI->CO (RR)	0.27775	2.55460	30.24640
	CON->CO (FR)	0.04111	0.89058	11.46260
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.28769	2.31978	24.13250
	B->CO (RR)	0.29024	2.31180	24.14810
	CI->CO (RR)	0.27126	2.34137	24.70580
	CON->CO (FR)	0.04623	0.93986	11.10420

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)	0.38474	3.06151	35.40540
	B->CO (FF)	0.35433	2.96263	34.37790
	CI->CO (FF)	0.34412	3.02847	35.68990
	CON->CO (RF)	0.03681	0.78420	10.11690
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.38507	2.85383	29.13260
	B->CO (FF)	0.35759	2.76964	28.36350
	CI->CO (FF)	0.34434	2.82115	29.43960
	CON->CO (RF)	0.04369	0.87774	10.47740

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)	0.26625	1.24865	10.69090
	B->CON (FR)	0.23444	1.17434	10.56410
	CI->CON (FR)	0.22559	1.21658	11.02870
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.25270	1.23655	10.70010
	B->CON (FR)	0.22184	1.16315	10.57230
	CI->CON (FR)	0.21197	1.20447	11.03730

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)	0.19198	0.95720	8.60726
	B->CON (RF)	0.19491	0.97852	9.02700
	CI->CON (RF)	0.17539	0.97982	9.21555
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.18495	0.95110	8.61596
	B->CON (RF)	0.18802	0.97274	9.03524
	CI->CON (RF)	0.16833	0.97089	9.22412

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)	0.56145	2.84544	27.02300
	B->S (-R)	0.60045	2.88635	26.66110
	CI->S (-R)	0.51779	2.80459	27.30000
	CON->S (RR)	0.15091	0.95925	8.40806
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.53990	2.82918	27.00480
	B->S (-R)	0.57846	2.86973	26.64300
	CI->S (-R)	0.49617	2.78874	27.28160
	CON->S (RR)	0.15098	0.95917	8.40704

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)	0.49749	2.32722	20.65790
	B->S (-F)	0.49211	2.25767	20.51000
	CI->S (-F)	0.47960	2.34254	21.21590
	CON->S (FF)	0.18995	0.90842	6.69647
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.48373	2.31738	20.64770
	B->S (-F)	0.47888	2.25012	20.50100
	CI->S (-F)	0.46597	2.33255	21.20260
	CON->S (FF)	0.19001	0.90835	6.69534

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	0.00238	0.00233	0.00459
	B	0.00291	0.00298	0.00529
	CI	0.00294	0.00314	0.00577
sky130_osu_sc_12T_ms__addf_l	A	0.00213	0.00203	0.00354
	B	0.00265	0.00266	0.00422
	CI	0.00268	0.00285	0.00461

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00730	0.00751	0.01127
	B	0.00771	0.00795	0.01113
	CI	0.00678	0.00710	0.01037
sky130_osu_sc_12T_ms__addf_l	A	0.00711	0.00726	0.00970
	B	0.00750	0.00770	0.00972
	CI	0.00657	0.00685	0.00895

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00781	0.00785	0.00902
	B	0.00769	0.00785	0.00904
	CI	0.00677	0.00700	0.00836
sky130_osu_sc_12T_ms__addf_l	A	0.00763	0.00764	0.00874
	B	0.00749	0.00764	0.00875
	CI	0.00656	0.00679	0.00806

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00236	0.00224	0.00317
	B	0.00288	0.00287	0.00384
	CI	0.00292	0.00306	0.00417
sky130_osu_sc_12T_ms__addf_l	A	0.00211	0.00198	0.00291
	B	0.00263	0.00261	0.00358
	CI	0.00268	0.00279	0.00391

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00730	0.00751	0.01090
	B	0.00770	0.00794	0.01080
	CI	0.00678	0.00709	0.01004
sky130_osu_sc_12T_ms__addf_l	A	0.00711	0.00729	0.01049
	B	0.00750	0.00772	0.01041
	CI	0.00657	0.00687	0.00964

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01586	0.01593	0.01821
	B	0.01458	0.01435	0.01804
	CI	0.01308	0.01300	0.01530
sky130_osu_sc_12T_ms__addf_l	A	0.01586	0.01593	0.01821
	B	0.01460	0.01437	0.01804
	CI	0.01308	0.01301	0.01530

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00561	0.00587	0.79419	0.81068	0.81344
sky130_osu_sc_12T_ms__addh_l	0.00561	0.00587	0.57919	0.81031	0.58927

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.04474	0.04734
sky130_osu_sc_12T_ms__addh_l	0.00000	0.17985	0.18232

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)	0.19872	1.00887	8.51081
	B->CO (RR)	0.20381	0.99102	8.53077
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.19189	1.04567	8.28589
	B->CO (RR)	0.19710	1.02929	8.31123

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)	0.15267	0.86840	6.96512
	B->CO (FF)	0.15925	0.88662	7.04729
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.15453	0.94866	7.31527
	B->CO (FF)	0.16103	0.96995	7.40965

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)	0.26923	1.04959	8.52965
	B->CON (RR)	0.27337	1.03014	8.54883
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.24841	1.02346	8.44944
	B->CON (RR)	0.25270	1.00474	8.47312

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)	0.20463	0.90865	7.07974
	B->CON (FF)	0.20049	0.91733	7.15230
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.18884	0.87650	6.90451
	B->CON (FF)	0.18493	0.88700	6.97488

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)	0.28344	1.86884	18.72960
	B->S (FR)	0.27874	1.87739	18.84610
	CON->S (FR)	0.04272	0.89953	11.57560
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.26861	1.74994	15.53860
	B->S (FR)	0.26412	1.76159	15.62870
	CON->S (FR)	0.04666	0.94642	11.23280

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)	0.35023	1.99149	19.96440
	B->S (RF)	0.35448	1.97143	19.97250
	CON->S (RF)	0.03630	0.78053	10.14820
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.33656	1.91178	17.02040
	B->S (RF)	0.34091	1.89146	17.03180
	CON->S (RF)	0.04284	0.87933	10.59210

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	0.00371	0.00359	0.00475
	B	0.00000	0.00000	0.00000
	B	0.00338	0.00323	0.00422
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00325	0.00308	0.00429
	B	0.00000	0.00000	0.00000
	B	0.00292	0.00273	0.00375

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	0.00532	0.00518	0.00662
	B	0.00000	0.00000	0.00000
	B	0.00553	0.00559	0.00713
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00485	0.00467	0.00615
	B	0.00000	0.00000	0.00000
	B	0.00506	0.00507	0.00662

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	0.00371	0.00359	0.00473
	B	0.00000	0.00000	0.00000
	B	0.00338	0.00323	0.00424
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00325	0.00308	0.00426
	B	0.00000	0.00000	0.00000
	B	0.00292	0.00272	0.00372

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	0.00532	0.00517	0.00613
	B	0.00000	0.00000	0.00000
	B	0.00553	0.00559	0.00712
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00485	0.00466	0.00613
	B	0.00000	0.00000	0.00000
	B	0.00506	0.00508	0.00659

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	0.00533	0.00518	0.00659
	B	0.00000	0.00000	0.00000
	B	0.00553	0.00560	0.00708
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00486	0.00467	0.00613
	B	0.00000	0.00000	0.00000
	B	0.00507	0.00507	0.00657

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	0.00371	0.00359	0.00475
	B	0.00000	0.00000	0.00000
	B	0.00338	0.00323	0.00427
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00325	0.00309	0.00432
	B	0.00000	0.00000	0.00000
	B	0.00292	0.00273	0.00376

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)	0.66187	0.62852	0.19869
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.66197	0.62862	0.19879

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)	0.66185	0.62866	0.20922
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.66195	0.62878	0.20932

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00297	0.00308	0.79459
sky130_osu_sc_12T_ms__and2_2	0.00297	0.00308	1.57933
sky130_osu_sc_12T_ms__and2_4	0.00298	0.00308	3.08789
sky130_osu_sc_12T_ms__and2_6	0.00301	0.00308	4.58881
sky130_osu_sc_12T_ms__and2_8	0.00298	0.00308	6.02929
sky130_osu_sc_12T_ms__and2_l	0.00222	0.00229	0.58121

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.01868	0.02525
sky130_osu_sc_12T_ms__and2_2	0.00000	0.02548	0.02625
sky130_osu_sc_12T_ms__and2_4	0.00000	0.04327	0.04918
sky130_osu_sc_12T_ms__and2_6	0.00000	0.06107	0.07212
sky130_osu_sc_12T_ms__and2_8	0.00000	0.07887	0.09505
sky130_osu_sc_12T_ms__and2_l	0.00000	0.18768	0.29670

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)	0.15034	0.91577	8.18707
	B->Y (RR)	0.15944	0.90859	8.19312
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.17184	0.85635	8.38937
	B->Y (RR)	0.18089	0.84235	8.38909
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.23594	0.89182	8.83305
	B->Y (RR)	0.24506	0.86845	8.78689
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.30040	0.95769	9.21425
	B->Y (RR)	0.30909	0.93080	9.12917
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.36164	1.02585	9.51451
	B->Y (RR)	0.37058	0.99941	9.39356
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.15693	0.99177	8.38699
	B->Y (RR)	0.16602	0.98523	8.37078

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)	0.11954	0.76941	6.36122
	B->Y (FF)	0.12326	0.78850	6.43579
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.13795	0.74075	6.63179
	B->Y (FF)	0.14114	0.75184	6.70120
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.19400	0.78378	7.11735
	B->Y (FF)	0.19461	0.78813	7.18403
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.25245	0.84537	7.52822
	B->Y (FF)	0.25021	0.84294	7.56575
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.30751	0.90229	7.77503
	B->Y (FF)	0.30274	0.89608	7.82482
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.12212	0.83397	6.41101
	B->Y (FF)	0.12943	0.85773	6.47886

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	0.00265	0.00246	0.00688
	B	0.00000	0.00000	0.00000
	B	0.00270	0.00230	0.00539
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00499	0.00496	0.00904
	B	0.00000	0.00000	0.00000
	B	0.00504	0.00489	0.00932
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01040	0.01066	0.01466
	B	0.00000	0.00000	0.00000
	B	0.01041	0.01056	0.01347
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01593	0.01631	0.02047
	B	0.00000	0.00000	0.00000
	B	0.01607	0.01622	0.01956
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02171	0.02190	0.02604
	B	0.00000	0.00000	0.00000
	B	0.02184	0.02175	0.02521
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00203	0.00185	0.00591
	B	0.00000	0.00000	0.00000
	B	0.00207	0.00178	0.00464

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	0.00656	0.00664	0.01137
	B	0.00000	0.00000	0.00000
	B	0.00739	0.00739	0.01185
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00810	0.00861	0.01324
	B	0.00000	0.00000	0.00000
	B	0.00897	0.00931	0.01369
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01213	0.01329	0.01778
	B	0.00000	0.00000	0.00000
	B	0.01297	0.01395	0.01824
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01626	0.01804	0.02270
	B	0.00000	0.00000	0.00000
	B	0.01715	0.01863	0.02300
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02040	0.02250	0.02740
	B	0.00000	0.00000	0.00000
	B	0.02128	0.02300	0.02759
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00487	0.00497	0.00969
	B	0.00000	0.00000	0.00000
	B	0.00544	0.00550	0.01005

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)	-0.00229	-0.00231	-0.00232
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00229	-0.00231	-0.00232
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00229	-0.00230	-0.00232
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00231	-0.00232	-0.00234
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00229	-0.00230	-0.00232
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00158	-0.00159	-0.00160

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00231	0.00231	0.00232
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00231	0.00236	0.00232
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00231	0.00236	0.00232
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00233	0.00238	0.00235
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00231	0.00236	0.00233
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00160	0.00163	0.00161

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)	-0.00220	-0.00220	-0.00221
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00220	-0.00222	-0.00221
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00220	-0.00222	-0.00221
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00220	-0.00221	-0.00221
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00220	-0.00221	-0.00221
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00153	-0.00154	-0.00153

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)	0.00223	0.00220	0.00221
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00223	0.00225	0.00221
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00223	0.00225	0.00221
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00223	0.00225	0.00221
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00223	0.00225	0.00222
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00156	0.00154

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00272	0.00291	0.00285	0.34791

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00964	0.01909

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)	0.13731	1.12702	10.49430
	A1->Y (FR)	0.11368	1.05076	10.05930
	B0->Y (FR)	0.10461	1.10421	10.91230

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)	0.10219	0.84396	8.22319
	A1->Y (RF)	0.09567	0.86831	8.76031
	B0->Y (RF)	0.05333	0.75300	8.19844

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	0.00556	0.00548	0.00581
	A1	0.00000	0.00000	0.00000
	A1	0.00474	0.00467	0.00498
	B0	0.00446	0.00432	0.00487

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00122	0.00101	0.00129
	A1	0.00000	0.00000	0.00000
	A1	0.00124	0.00103	0.00145
	B0	-0.00046	-0.00055	-0.00029

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)	-0.00167	-0.00192	-0.00191
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00194	-0.00196	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00194	-0.00195	-0.00195

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)	0.00190	0.00192	0.00191
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00194	0.00197	0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00197	0.00197	0.00195

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)	-0.00167	-0.00190	-0.00191
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00194	-0.00196	-0.00195
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00211	-0.00212	-0.00213

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)	0.00189	0.00190	0.00191
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00194	0.00198	0.00195
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00213	0.00214	0.00214

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00092	-0.00092	-0.00091

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)	0.00100	0.00101	0.00094

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__aoi22_1	0.00272	0.00290	0.00304	0.00285	0.34390

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.01039	0.02294

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)	0.17382	1.16866	10.48890
	A1->Y (FR)	0.15602	1.14528	10.43650
	B0->Y (FR)	0.11022	1.10751	10.84620
	B1->Y (FR)	0.12836	1.12664	10.90780

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)	0.13611	0.87701	8.20815
	A1->Y (RF)	0.12937	0.90139	8.74645
	B0->Y (RF)	0.06964	0.83427	8.67890
	B1->Y (RF)	0.07713	0.80994	8.14074

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	0.00675	0.00668	0.00694
	A1	0.00595	0.00587	0.00613
	B0	0.00478	0.00467	0.00541
	B1	0.00559	0.00538	0.00625

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00244	0.00224	0.00250
	A1	0.00246	0.00224	0.00265
	B0	-0.00029	-0.00037	0.00007
	B1	-0.00025	-0.00037	-0.00007

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00171	-0.00192	-0.00190
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00194	-0.00196	-0.00195
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00194	-0.00195	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00194	-0.00194	-0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00190	0.00193	0.00190
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00194	0.00196	0.00195
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00197	0.00197	0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00197	0.00197	0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00171	-0.00192	-0.00190
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00195	-0.00196	-0.00195
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00210	-0.00211	-0.00212
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00210	-0.00211	-0.00212

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)	0.00190	0.00192	0.00190
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00196	0.00198	0.00196
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00213	0.00213	0.00213
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00212	0.00213	0.00213

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)	-0.00091	-0.00092	-0.00091
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00090	-0.00092	-0.00091
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00220	-0.00220	-0.00222
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00220	-0.00220	-0.00222

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)	0.00104	0.00104	0.00095
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00091	0.00092	0.00091
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00222	0.00223	0.00222
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00222	0.00223	0.00222

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)	-0.00092	-0.00093	-0.00092
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00092	-0.00093	-0.00092
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00204	-0.00205	-0.00205
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00204	-0.00205	-0.00205

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)	0.00105	0.00106	0.00096
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00092	0.00093	0.00092
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00207	0.00207	0.00205
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00207	0.00206	0.00205

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00309	0.75391
sky130_osu_sc_12T_ms__buf_2	0.00309	1.54226
sky130_osu_sc_12T_ms__buf_4	0.00308	3.06384
sky130_osu_sc_12T_ms__buf_6	0.00084	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00309	6.11004
sky130_osu_sc_12T_ms__buf_l	0.00226	0.58130

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.01620	0.01620
sky130_osu_sc_12T_ms__buf_2	0.00000	0.02076	0.02525
sky130_osu_sc_12T_ms__buf_4	0.00000	0.03342	0.04818
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.05873	0.09406
sky130_osu_sc_12T_ms__buf_l	0.00000	0.15119	0.15119

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)**	0.10194	0.85851	7.96732
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.10910	0.77162	8.13115
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.14518	0.76751	8.54215
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.21604	0.83933	9.19425
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.10813	0.92387	8.17121

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)**	0.11355	0.74753	6.05395
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.13228	0.72586	6.49230
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.18840	0.77419	7.05733
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.30150	0.89454	7.85242
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.11898	0.83019	6.40061

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00258	0.00225	0.00609
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00486	0.00475	0.00846
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01016	0.01048	0.01400
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02098	0.02166	0.02609
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00197	0.00171	0.00550

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	0.00642	0.00638	0.01105
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00794	0.00824	0.01273
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01192	0.01286	0.01720
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02027	0.02193	0.02657
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00485	0.00491	0.00981

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
	-0.00054	-0.00054	-0.00052

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	0.00054	0.00054	0.00052

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00284	0.00284	0.00915	0.79093	0.79281
sky130_osu_sc_12T_ms__dffnr_l	0.00284	0.00284	0.00915	0.58445	0.58444

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.13521	0.25807
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.27019	0.39305

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)	0.69024	2.25973	18.19030
	QN->Q (FR)	0.04572	0.95354	12.20620
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.68796	2.42557	18.44410
	QN->Q (FR)	0.04882	0.98891	11.69880

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)	0.44802	2.04880	19.22230
	QN->Q (RF)	0.03929	0.82199	10.54900
	RN->Q (FF)	0.41351	2.05680	19.38840
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.45262	2.27614	19.89050
	QN->Q (RF)	0.04526	0.91369	10.92830
	RN->Q (FF)	0.41852	2.28594	20.05660

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)	0.37984	1.14647	8.25206
	RN->QN (FR)	0.34501	1.15552	8.42004
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.37216	1.19473	8.15568
	RN->QN (FR)	0.33764	1.20424	8.31822

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)**	0.61394	1.34308	7.04872
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.60771	1.41440	7.48586

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)	-0.19998	-0.42446	-2.64429
	setup	CK (F)	0.32446	0.45372	2.69673
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.20191	-0.42443	-2.64439
	setup	CK (F)	0.32434	0.45372	2.69677

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)	-0.13879	-0.16703	-0.48064
	setup	CK (F)	0.33326	0.35696	1.31394
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14164	-0.16937	-0.47858
	setup	CK (F)	0.32943	0.35726	1.31699

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)	-0.19998	-0.42446	-2.64429
	setup	CK (F)	0.32446	0.45372	2.69673
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.20191	-0.42443	-2.64439
	setup	CK (F)	0.32434	0.45372	2.69677

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)	-0.13879	-0.16703	-0.48064
	setup	CK (F)	0.33326	0.35696	1.31394
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14164	-0.16937	-0.47858
	setup	CK (F)	0.32943	0.35726	1.31699

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)	0.24584	0.28012	0.86814
	removal	CK (F)	-0.17001	-0.22625	-0.85103
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.24287	0.27880	0.86518
	removal	CK (F)	-0.17001	-0.22625	-0.85103

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)	0.24584	0.28012	0.86814
	removal	CK (F)	-0.17001	-0.22625	-0.85103
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.24287	0.27880	0.86518
	removal	CK (F)	-0.17001	-0.22625	-0.85103

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 ()	0.25577	0.51392	13.33370
	min_pulse_width	RN ()	0.25577	0.51392	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.24807	0.51392	13.33370
	min_pulse_width	RN ()	0.24807	0.51392	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 ()	0.30201	0.51392	13.33370
	min_pulse_width	CK ()	0.40604	0.51392	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.30201	0.51392	13.33370
	min_pulse_width	CK ()	0.40604	0.51392	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 ()	0.32127	0.51392	13.33370
	min_pulse_width	CK ()	0.21339	0.51392	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.30972	0.51392	13.33370
	min_pulse_width	CK ()	0.20954	0.51392	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	0.01235	0.01200	0.00940
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01165	0.01138	0.01118

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	0.01230	0.01165	0.01026
	RN	-0.00086	-0.03950	-0.50619
	RN	0.01617	0.01558	0.01187
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01159	0.01106	0.01258
	RN	-0.00086	-0.03294	-0.37405
	RN	0.01545	0.01500	0.01404

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	0.01230	0.01163	0.01023
	RN	-0.00086	-0.03956	-0.50735
	RN	0.01616	0.01556	0.01171
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01158	0.01106	0.01248
	RN	-0.00086	-0.03294	-0.37401
	RN	0.01544	0.01498	0.01393

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	0.01233	0.01198	0.00926
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01163	0.01136	0.01111

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)	0.00776	0.00732	0.00988
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00265	0.00226	0.00493
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00182	-0.00211	-0.00213
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)	0.00776	0.00732	0.00988
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00265	0.00226	0.00493
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00182	-0.00211	-0.00213

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)	0.01253	0.01230	0.01504
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00667	0.00649	0.00925
	!CK	0.00000	0.00000	0.00000
	!CK	0.00212	0.00214	0.00213
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)	0.01253	0.01231	0.01504
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00667	0.00649	0.00925
	!CK	0.00000	0.00000	0.00000
	!CK	0.00212	0.00214	0.00214

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)	0.00781	0.00732	0.01170
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00250	0.00217	0.00648
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00782	0.00733	0.01170
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00250	0.00217	0.00648

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)	0.01231	0.01193	0.01661
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00635	0.00620	0.01105
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01231	0.01193	0.01661
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00636	0.00620	0.01105

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)	-0.00034	-0.00095	0.00328
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00842	0.00717	0.01492
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00236	0.00135	0.00994
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01040	0.00954	0.01434
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00028	-0.00089	0.00335
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00095	0.00328
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00842	0.00717	0.01492
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00236	0.00135	0.00995
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01040	0.00954	0.01434
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00028	-0.00089	0.00335

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)	0.01002	0.00974	0.01458
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01319	0.01283	0.02213
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01093	0.01068	0.01530
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01002	0.00974	0.01458
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01320	0.01283	0.02213
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01093	0.01067	0.01530

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00284	0.00284	0.00874	0.79127	0.79234
sky130_osu_sc_12T_ms__dffr_l	0.00284	0.00284	0.00874	0.58162	0.58450

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.13521	0.25822
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.27019	0.39320

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)	0.55783	2.08081	18.06210
	QN->Q (FR)	0.04571	0.95372	12.20900
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.55517	2.24056	18.23170
	QN->Q (FR)	0.04882	0.98708	11.66210

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)	0.56608	2.18419	19.54670
	QN->Q (RF)	0.03929	0.82208	10.55160
	RN->Q (FF)	0.41413	2.05891	19.39840
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.57058	2.40723	20.12760
	QN->Q (RF)	0.04525	0.91209	10.88990
	RN->Q (FF)	0.41918	2.28242	19.96920

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)	0.49782	1.28193	8.56410
	RN->QN (FR)	0.34547	1.15670	8.41796
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.49002	1.33112	8.47991
	RN->QN (FR)	0.33809	1.20564	8.32108

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)**	0.48142	1.16332	6.91531
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.47497	1.23444	7.35051

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)	-0.13034	-0.13744	-0.33146
	setup	CK (R)	0.42544	0.42221	1.14694
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12843	-0.13753	-0.33214
	setup	CK (R)	0.42566	0.42214	1.15088

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)	-0.21122	-0.46198	-2.52698
	setup	CK (R)	0.25917	0.47903	2.55403
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.21267	-0.46032	-2.52588
	setup	CK (R)	0.25805	0.48101	2.55304

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)	-0.13034	-0.13744	-0.33146
	setup	CK (R)	0.42544	0.42221	1.14694
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12843	-0.13753	-0.33214
	setup	CK (R)	0.42566	0.42214	1.15088

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)	-0.21122	-0.46198	-2.52698
	setup	CK (R)	0.25917	0.47903	2.55403
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.21267	-0.46032	-2.52588
	setup	CK (R)	0.25805	0.48101	2.55304

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)	0.34491	0.36256	1.19713
	removal	CK (R)	-0.06492	-0.07340	-0.11215
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.34456	0.36258	1.19698
	removal	CK (R)	-0.06492	-0.07340	-0.11215

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)	0.34491	0.36256	1.19713
	removal	CK (R)	-0.06492	-0.07340	-0.11215
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.34456	0.36258	1.19698
	removal	CK (R)	-0.06492	-0.07340	-0.11215

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 ()	0.25577	0.51392	13.33370
	min_pulse_width	RN ()	0.25577	0.51392	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.24807	0.51392	13.33370
	min_pulse_width	RN ()	0.24807	0.51392	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 ()	0.25963	0.51392	13.33370
	min_pulse_width	CK ()	0.30586	0.51392	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.24422	0.51392	13.33370
	min_pulse_width	CK ()	0.29816	0.51392	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 ()	0.54091	0.56649	13.33370
	min_pulse_width	CK ()	0.22110	0.51392	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.53877	0.56649	13.33370
	min_pulse_width	CK ()	0.22110	0.51392	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	0.00646	0.00573	0.00441
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00576	0.00511	0.00658

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	0.00737	0.00665	0.00273
	RN	-0.00086	-0.03951	-0.50641
	RN	0.01676	0.01616	0.01242
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00665	0.00608	0.00498
	RN	-0.00086	-0.03285	-0.37224
	RN	0.01604	0.01557	0.01457

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	0.00737	0.00665	0.00275
	RN	-0.00086	-0.03954	-0.50704
	RN	0.01675	0.01615	0.01229
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00665	0.00607	0.00498
	RN	-0.00086	-0.03295	-0.37405
	RN	0.01603	0.01556	0.01450

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	0.00645	0.00572	0.00472
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00575	0.00509	0.00660

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	-0.00160	-0.00192	-0.00193
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00787	0.00743	0.00998
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00322	0.00282	0.00549
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00160	-0.00191	-0.00193
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00787	0.00743	0.00998
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00322	0.00282	0.00549

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	0.00192	0.00193	0.00193
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01243	0.01220	0.01495
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00610	0.00592	0.00870
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00192	0.00193	0.00193
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01243	0.01220	0.01495
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00610	0.00592	0.00870

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)	0.00250	0.00217	0.00648
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00740	0.00691	0.01129
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)	0.00250	0.00217	0.00648
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00740	0.00691	0.01129

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)	0.00635	0.00620	0.01105
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01272	0.01237	0.01702
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)	0.00635	0.00620	0.01105
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01272	0.01237	0.01702

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)	-0.00051	-0.00104	0.00319
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00391	0.00315	0.00733
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00054	-0.00111	0.00318
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00051	-0.00104	0.00319
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00391	0.00315	0.00733
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00053	-0.00111	0.00318

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)	0.00986	0.00961	0.01449
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02018	0.01948	0.02411
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01531	0.01490	0.01937
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01993	0.01940	0.02845
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01086	0.01055	0.01529
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00986	0.00961	0.01449
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02018	0.01948	0.02411
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01531	0.01490	0.01937
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01993	0.01940	0.02845
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01086	0.01055	0.01529

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00280	0.00285	0.00660	0.00893	0.81394	0.81969
sky130_osu_sc_12T_ms__dffsr_l	0.00280	0.00285	0.00660	0.00893	0.58054	0.58509

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.06828	0.09032
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.20327	0.22531

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)	0.59339	2.13782	18.47700
	QN->Q (FR)	0.04360	0.93117	12.01210
	RN->Q (RR)	0.47394	2.03981	18.48000
	SN->Q (FR)	0.42557	1.99605	18.59990
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.59880	2.29809	18.32910
	QN->Q (FR)	0.04872	0.98594	11.64350
	RN->Q (RR)	0.47942	2.20061	18.32820
	SN->Q (FR)	0.43413	2.15589	18.42270

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)	0.67356	2.30868	19.90440
	QN->Q (RF)	0.03901	0.82924	10.71190
	RN->Q (FF)	0.43593	2.09302	19.72700
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.67911	2.52725	20.22510
	QN->Q (RF)	0.04504	0.90856	10.87300
	RN->Q (FF)	0.44378	2.31482	20.03990

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)	0.60236	1.40148	8.75721
	RN->QN (FR)	0.36714	1.18685	8.58275
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.59481	1.45225	8.62316
	RN->QN (FR)	0.36197	1.24062	8.43925

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)	0.51975	1.22268	7.21510
	RN->QN (RF)	0.40061	1.12510	7.21825
	SN->QN (FF)	0.35746	1.08428	7.33555
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.51961	1.29442	7.48485
	RN->QN (RF)	0.40029	1.19748	7.48509
	SN->QN (FF)	0.35537	1.15226	7.58112

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)	-0.15286	-0.15994	-0.44307
	setup	CK (R)	0.44389	0.42954	1.21799
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15249	-0.15887	-0.44188
	setup	CK (R)	0.44232	0.42876	1.21812

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)	-0.24978	-0.49038	-2.65830
	setup	CK (R)	0.32217	0.50577	2.68128
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.25017	-0.48779	-2.65630
	setup	CK (R)	0.32197	0.50577	2.68112

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)	-0.15286	-0.15994	-0.44307
	setup	CK (R)	0.44389	0.42954	1.21799
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15249	-0.15887	-0.44188
	setup	CK (R)	0.44232	0.42876	1.21812

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)	-0.24978	-0.49038	-2.65830
	setup	CK (R)	0.32217	0.50577	2.68128
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.25017	-0.48779	-2.65630
	setup	CK (R)	0.32197	0.50577	2.68112

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)	0.32471	0.33250	1.16997
	removal	CK (R)	-0.04703	-0.05587	-0.11144
	hold	SN (R)	-0.34453	-0.55903	-2.55950
	setup	SN (R)	0.38489	0.60679	4.49373
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.32461	0.33156	1.16944
	removal	CK (R)	-0.04703	-0.05587	-0.11144
	hold	SN (R)	-0.33719	-0.55094	-2.51136
	setup	SN (R)	0.38107	0.60180	4.40056

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)	0.32471	0.33250	1.16997
	removal	CK (R)	-0.04703	-0.05587	-0.11144
	hold	SN (R)	-0.34511	-0.55903	-2.55950
	hold	SN (R)	-0.34453	-0.55927	-2.57094
	setup	SN (R)	0.38400	0.60382	4.34266
	setup	SN (R)	0.38489	0.60679	4.49373
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.32461	0.33156	1.16944
	removal	CK (R)	-0.04703	-0.05587	-0.11144
	hold	SN (R)	-0.33738	-0.55094	-2.51136
	hold	SN (R)	-0.33719	-0.55260	-2.52499
	setup	SN (R)	0.38107	0.59519	4.25097
	setup	SN (R)	0.36388	0.60180	4.40056

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 ()	0.28660	0.51392	13.33370
	min_pulse_width	RN ()	0.29430	0.51392	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.28660	0.51392	13.33370
	min_pulse_width	RN ()	0.28660	0.51392	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)	0.09250	0.12031	2.59034
	removal	CK (R)	-0.03648	-0.08290	-0.50038
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.09265	0.11968	2.44945
	removal	CK (R)	-0.03648	-0.08290	-0.50038

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)	0.09250	0.12031	2.59034
	removal	CK (R)	-0.03648	-0.08290	-0.50038
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.09265	0.11968	2.44945
	removal	CK (R)	-0.03648	-0.08290	-0.50038

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 ()	0.33025	0.54896	13.33370
	min_pulse_width	SN ()	0.34189	0.55115	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.32989	0.53801	13.33370
	min_pulse_width	SN ()	0.32232	0.54239	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 ()	0.27889	0.51392	13.33370
	min_pulse_width	CK ()	0.32898	0.51392	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.27119	0.51392	13.33370
	min_pulse_width	CK ()	0.32513	0.51392	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 ()	0.55998	0.57963	13.33370
	min_pulse_width	CK ()	0.29045	0.51392	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.56004	0.57744	13.33370
	min_pulse_width	CK ()	0.29045	0.51392	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	0.00805	0.00734	0.00622
	RN	0.01475	0.01427	0.01115
	SN	-0.00086	-0.04019	-0.52092
	SN	0.01641	0.01585	0.01283
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00739	0.00677	0.00822
	RN	0.01408	0.01369	0.01284
	SN	-0.00086	-0.03281	-0.37155
	SN	0.01574	0.01528	0.01484

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	0.00858	0.00808	0.00586
	RN	-0.00086	-0.04019	-0.52092
	RN	0.01755	0.01703	0.01491
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00789	0.00738	0.00636
	RN	-0.00086	-0.03281	-0.37155
	RN	0.01685	0.01633	0.01543

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	0.00858	0.00807	0.00579
	RN	-0.00086	-0.04036	-0.52453
	RN	0.01755	0.01702	0.01478
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00788	0.00737	0.00632
	RN	-0.00086	-0.03297	-0.37443
	RN	0.01684	0.01632	0.01531

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	0.00803	0.00732	0.00619
	RN	0.01473	0.01426	0.01111
	SN	-0.00086	-0.04036	-0.52456
	SN	0.01639	0.01582	0.01276
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00737	0.00675	0.00809
	RN	0.01406	0.01368	0.01312
	SN	-0.00086	-0.03297	-0.37445
	SN	0.01572	0.01524	0.01482

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	-0.00190	-0.00194	-0.00193
	(!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)	0.00999	0.00958	0.01209
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00357	0.00319	0.00578
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00355	0.00317	0.00576
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00359	0.00321	0.00580
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00190	-0.00194	-0.00193
	(!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)	0.00999	0.00958	0.01209
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00357	0.00319	0.00578
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00355	0.00317	0.00576
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00359	0.00321	0.00580

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	0.00195	0.00194	0.00193
	(!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)	0.01435	0.01412	0.01672
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00662	0.00648	0.00924
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00667	0.00652	0.00925
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00660	0.00646	0.00922
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00195	0.00195	0.00193
	(!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)	0.01435	0.01412	0.01672
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00663	0.00648	0.00924
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00667	0.00652	0.00925
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00660	0.00646	0.00922

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)	0.00205	0.00168	0.00589
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00877	0.00823	0.01235
sky130_osu_sc_12T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00205	0.00168	0.00589
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00877	0.00823	0.01235

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)	0.00690	0.00678	0.01172
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01348	0.01307	0.01776
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)	0.00690	0.00678	0.01172
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01348	0.01307	0.01776

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)	-0.00486	-0.00487	-0.00488
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00480	-0.00528	-0.00526
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00467	-0.00493	-0.00492
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00251	0.00207	0.00497
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)	-0.00485	-0.00487	-0.00488
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00480	-0.00528	-0.00526
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00467	-0.00493	-0.00492
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00251	0.00208	0.00497

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)	0.00489	0.00492	0.00490
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00524	0.00528	0.00526
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00489	0.00495	0.00492
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01090	0.01065	0.01306
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)	0.00489	0.00492	0.00490
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00524	0.00528	0.00526
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00489	0.00495	0.00492
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01090	0.01065	0.01306

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)	-0.00056	-0.00110	0.00312
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00464	0.00387	0.00807
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00454	0.00381	0.00803
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00042	-0.00100	0.00327
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00248	0.00145	0.00986
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00056	-0.00110	0.00312
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00460	0.00387	0.00808
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00454	0.00382	0.00803
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00042	-0.00100	0.00327
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00249	0.00145	0.00987

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)	0.02253	0.02190	0.02645
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01004	0.00976	0.01464
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01560	0.01523	0.01967
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01563	0.01526	0.01979
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02194	0.02130	0.03026
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01087	0.01054	0.01528
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01353	0.01310	0.02248
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02253	0.02190	0.02645
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01004	0.00976	0.01464
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01560	0.01523	0.01967
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01563	0.01526	0.01979
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02194	0.02130	0.03026
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01087	0.01054	0.01528
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01353	0.01310	0.02248

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00282	0.00533	0.00885	0.80104	0.79898
sky130_osu_sc_12T_ms__dffs_l	0.00282	0.00534	0.00885	0.58231	0.58569

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.24199	0.62731
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.37697	0.76229

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)	0.41864	1.92651	18.08800
	QN->Q (FR)	0.04569	0.95587	12.26670
	SN->Q (FR)	0.29925	1.86731	17.87220
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.42338	2.09112	18.08900
	QN->Q (FR)	0.04879	0.98571	11.64800
	SN->Q (FR)	0.30320	2.02617	17.83320

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)	0.65397	2.29506	19.84460
	QN->Q (RF)	0.03913	0.82320	10.60120
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.65150	2.50036	20.22190
	QN->Q (RF)	0.04513	0.91100	10.88200

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)	0.58087	1.38469	8.70962
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.56591	1.42263	8.57469

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)	0.34987	1.00508	6.79943
	SN->QN (FF)	0.23000	0.94702	6.58059
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.34980	1.08755	7.21320
	SN->QN (FF)	0.22906	1.02306	6.95577

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)	-0.10970	-0.12313	-0.30088
	setup	CK (R)	0.30039	0.30535	1.09758
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10818	-0.12302	-0.30039
	setup	CK (R)	0.29897	0.30485	1.10000

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)	-0.22717	-0.46813	-2.56357
	setup	CK (R)	0.30597	0.48728	2.58873
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.22870	-0.46857	-2.56419
	setup	CK (R)	0.30599	0.48728	2.58873

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)	-0.10970	-0.12313	-0.30088
	setup	CK (R)	0.30039	0.30535	1.09758
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10818	-0.12302	-0.30039
	setup	CK (R)	0.29897	0.30485	1.10000

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)	-0.22717	-0.46813	-2.56357
	setup	CK (R)	0.30597	0.48728	2.58873
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.22870	-0.46857	-2.56419
	setup	CK (R)	0.30599	0.48728	2.58873

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)	0.10284	0.13800	1.67262
	removal	CK (R)	-0.04973	-0.09846	-0.77900
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.10293	0.13800	1.54859
	removal	CK (R)	-0.04973	-0.09846	-0.77900

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)	0.10284	0.13800	1.67262
	removal	CK (R)	-0.04973	-0.09846	-0.77900
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.10293	0.13800	1.54859
	removal	CK (R)	-0.04973	-0.09846	-0.77900

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 ()	0.19798	0.51392	13.33370
	min_pulse_width	SN ()	0.20184	0.51392	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.19413	0.51392	13.33370
	min_pulse_width	SN ()	0.19413	0.51392	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 ()	0.19028	0.51392	13.33370
	min_pulse_width	CK ()	0.32513	0.51392	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.18257	0.51392	13.33370
	min_pulse_width	CK ()	0.31742	0.51392	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 ()	0.41759	0.51392	13.33370
	min_pulse_width	CK ()	0.27889	0.51392	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.41759	0.51392	13.33370
	min_pulse_width	CK ()	0.27889	0.51392	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	0.00648	0.00575	0.00475
	SN	-0.00086	-0.03980	-0.51267
	SN	0.01382	0.01320	0.01221
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00577	0.00512	0.00663
	SN	-0.00086	-0.03287	-0.37268
	SN	0.01311	0.01259	0.01422

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	0.00730	0.00664	0.00283
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00660	0.00606	0.00510

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	0.00730	0.00664	0.00286
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00659	0.00605	0.00506

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	0.00646	0.00573	0.00472
	SN	-0.00086	-0.03974	-0.51130
	SN	0.01381	0.01319	0.01216
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00575	0.00511	0.00662
	SN	-0.00086	-0.03299	-0.37483
	SN	0.01310	0.01257	0.01410

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	-0.00192	-0.00196	-0.00196
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00759	0.00715	0.00986
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00319	0.00279	0.00544
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00192	-0.00195	-0.00196
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00759	0.00716	0.00986
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00319	0.00280	0.00544

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	0.00198	0.00197	0.00196
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01220	0.01194	0.01467
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00611	0.00594	0.00879
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00198	0.00198	0.00196
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01221	0.01194	0.01467
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00611	0.00594	0.00879

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)	-0.00351	-0.00353	-0.00353
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00244	0.00205	0.00499
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)	-0.00351	-0.00353	-0.00353
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00245	0.00205	0.00499

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)	0.00354	0.00358	0.00354
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00746	0.00723	0.01145
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)	0.00354	0.00358	0.00354
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00746	0.00723	0.01146

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)	-0.00051	-0.00104	0.00319
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00047	-0.00104	0.00327
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00216	0.00114	0.00971
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00051	-0.00104	0.00319
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00047	-0.00104	0.00327
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00216	0.00114	0.00971

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)	0.01999	0.01932	0.02400
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00987	0.00962	0.01449
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01961	0.01895	0.02803
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01081	0.01049	0.01524
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01282	0.01244	0.02193
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01999	0.01932	0.02400
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00987	0.00962	0.01449
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01961	0.01895	0.02803
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01081	0.01050	0.01524
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01282	0.01244	0.02193

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00297	0.00869	0.73819
sky130_osu_sc_12T_ms__dff_l	0.00297	0.00869	0.55299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.05726	0.06604
sky130_osu_sc_12T_ms__dff_l	0.00000	0.19225	0.20103

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)**	0.36931	1.13882	8.28888
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.37043	1.19502	8.20516

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)**	0.51867	1.16363	6.64620
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.51915	1.25406	7.15772

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)	-0.10982	-0.12467	-0.34731
	setup	CK (R)	0.26513	0.27012	1.10095
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.10795	-0.12414	-0.34707
	setup	CK (R)	0.26315	0.26991	1.10416

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)	-0.20193	-0.46552	-2.56970
	setup	CK (R)	0.24040	0.48115	2.59063
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.20005	-0.46511	-2.56935
	setup	CK (R)	0.24042	0.48113	2.59061

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 ()	0.17872	0.51392	13.33370
	min_pulse_width	CK ()	0.29045	0.51392	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.17487	0.51392	13.33370
	min_pulse_width	CK ()	0.28275	0.51392	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 ()**	0.37521	0.51392	13.33370
	min_pulse_width	**CK ()**	0.19798	0.51392	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.37521	0.51392	13.33370
	min_pulse_width	**CK ()**	0.19798	0.51392	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	0.01369	0.01260	0.02044
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01223	0.01112	0.01898

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	0.01500	0.01438	0.01852
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01358	0.01292	0.01712

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	-0.00160	-0.00192	-0.00192
	!CK	0.00000	0.00000	0.00000
	!CK	0.00710	0.00662	0.00922
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00160	-0.00192	-0.00192
	!CK	0.00000	0.00000	0.00000
	!CK	0.00710	0.00662	0.00922

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	0.00190	0.00192	0.00192
	!CK	0.00000	0.00000	0.00000
	!CK	0.01268	0.01237	0.01520
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00191	0.00192	0.00192
	!CK	0.00000	0.00000	0.00000
	!CK	0.01268	0.01238	0.01520

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)	-0.00054	-0.00107	0.00317
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00047	-0.00104	0.00326
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00054	-0.00106	0.00317
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00047	-0.00103	0.00326

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)	0.00984	0.00959	0.01447
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01947	0.01880	0.02352
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01993	0.01928	0.02847
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01074	0.01043	0.01518
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00984	0.00958	0.01448
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01947	0.01880	0.02352
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01993	0.01929	0.02847
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01075	0.01043	0.01518

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00288	0.73386
sky130_osu_sc_12T_ms__inv_10	0.02582	7.41368
sky130_osu_sc_12T_ms__inv_2	0.00536	1.49679
sky130_osu_sc_12T_ms__inv_3	0.00793	2.21674
sky130_osu_sc_12T_ms__inv_4	0.01045	2.98190
sky130_osu_sc_12T_ms__inv_6	0.01565	4.44276
sky130_osu_sc_12T_ms__inv_8	0.02073	5.90020
sky130_osu_sc_12T_ms__inv_l	0.00222	0.53614

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00810	0.01389
sky130_osu_sc_12T_ms__inv_10	0.00000	0.06329	0.11468
sky130_osu_sc_12T_ms__inv_2	0.00000	0.01266	0.02294
sky130_osu_sc_12T_ms__inv_3	0.00000	0.02076	0.03682
sky130_osu_sc_12T_ms__inv_4	0.00000	0.02532	0.04587
sky130_osu_sc_12T_ms__inv_6	0.00000	0.03797	0.06881
sky130_osu_sc_12T_ms__inv_8	0.00000	0.05063	0.09174
sky130_osu_sc_12T_ms__inv_l	0.00000	0.07559	0.14901

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)**	0.04464	0.89734	11.25470
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.04296	0.57856	11.29280
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.03229	0.75471	11.16870
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.03367	0.70112	11.18980
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.03224	0.66126	11.20310
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.03430	0.61567	11.19180
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.03817	0.59378	11.19350
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.04919	0.93435	10.84600

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)**	0.03683	0.75774	9.58475
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.03975	0.52239	9.86475
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02820	0.66261	9.69534
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.02955	0.62493	9.79454
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02828	0.59505	9.80327
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.03169	0.56103	9.81855
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03550	0.53774	9.82704
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.04403	0.85135	10.03210

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	0.00335	0.00338	0.00387
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02742	0.02872	0.03424
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00575	0.00589	0.00462
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00884	0.00902	0.00355
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01123	0.01166	0.01376
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01665	0.01675	0.02062
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02205	0.02311	0.02739
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00258	0.00261	0.00325

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	-0.00056	-0.00060	-0.00026
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01021	-0.00927	-0.00521
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00188	-0.00186	-0.00113
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00244	-0.00240	-0.00131
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00383	-0.00362	-0.00217
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00588	-0.00570	-0.00321
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00800	-0.00769	-0.00419
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00038	-0.00043	-0.00025

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.14130	0.14123	0.00593	0.14092

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.01997	0.02131

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)	-	0.02428	0.38995	3.62688
	A1->Y (RR)	-	0.02905	0.39443	3.63081
	S0->Y (RR)	(!A0 * A1)	0.08361	0.46381	2.25677
	S0->Y (FR)	(A0 * !A1)	0.04682	0.50011	3.48793

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)	-	0.02705	0.38125	3.50739
	A1->Y (FF)	-	0.02296	0.37667	3.50642
	S0->Y (FF)	(!A0 * A1)	0.10455	0.47240	1.95761
	S0->Y (RF)	(A0 * !A1)	0.03934	0.46022	3.46911

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	-	-0.00317	-0.00317	-0.00317
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00215	-0.00215	-0.00215
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00429	0.00417	0.00956
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00210	-0.00249	0.00227

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	-	0.00317	0.00318	0.00318
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00215	0.00215	0.00215
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00062	0.00021	0.00515
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00882	0.00868	0.01379

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00079	-0.00079	-0.00079

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00079	0.00079	0.00079

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00094	-0.00094	-0.00094

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00094	0.00094	0.00094

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00077	-0.00118	0.00371
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00074	-0.00118	0.00372

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)	0.00685	0.00671	0.01188
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00627	0.00617	0.01149

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00287	0.00286	0.56415
sky130_osu_sc_12T_ms__nand2_l	0.00217	0.00220	0.40815

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00768	0.02294
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.07538	0.29452

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)	0.04656	0.81829	9.72651
	B->Y (FR)	0.05262	0.80527	9.47423
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.04950	0.84431	9.30579
	B->Y (FR)	0.05756	0.85352	9.30260

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)	0.06510	0.99311	11.47280
	B->Y (RF)	0.07284	0.96979	10.96130
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.07421	1.10512	11.73020
	B->Y (RF)	0.08186	1.08344	11.25970

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	0.00352	0.00333	0.00408
	B	0.00000	0.00000	0.00000
	B	0.00437	0.00431	0.00490
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00259	0.00250	0.00330
	B	0.00000	0.00000	0.00000
	B	0.00316	0.00317	0.00386

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	-0.00036	-0.00046	-0.00011
	B	0.00000	0.00000	0.00000
	B	-0.00034	-0.00047	-0.00023
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00022	-0.00027	-0.00010
	B	0.00000	0.00000	0.00000
	B	-0.00021	-0.00029	-0.00016

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00221	-0.00222	-0.00223
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00153	-0.00154	-0.00155

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)	0.00223	0.00228	0.00224
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00155	0.00158	0.00155

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)	-0.00208	-0.00209	-0.00208
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00146	-0.00147	-0.00146

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)	0.00210	0.00211	0.00209
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00148	0.00147	0.00147

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00283	0.00310	0.38163
sky130_osu_sc_12T_ms__nor2_l	0.00209	0.00230	0.28914

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00773	0.01389
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.05339	0.14900

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)	0.10190	1.07297	10.65400
	B->Y (FR)	0.08197	1.06068	10.92290
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.10506	1.14681	10.54530
	B->Y (FR)	0.08961	1.12885	10.67670

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)	0.04969	0.64538	7.14230
	B->Y (RF)	0.03929	0.63160	7.12154
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.05582	0.71810	7.57544
	B->Y (RF)	0.04596	0.70516	7.55762

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	0.00461	0.00453	0.00491
	B	0.00000	0.00000	0.00000
	B	0.00364	0.00360	0.00437
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00328	0.00323	0.00358
	B	0.00000	0.00000	0.00000
	B	0.00268	0.00262	0.00358

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00053	0.00038	0.00083
	B	0.00000	0.00000	0.00000
	B	-0.00043	-0.00045	-0.00001
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00040	0.00028	0.00055
	B	0.00000	0.00000	0.00000
	B	-0.00025	-0.00028	-0.00004

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00161	-0.00194	-0.00193
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00103	-0.00128	-0.00130

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)	0.00193	0.00195	0.00193
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00130	0.00131	0.00131

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)	-0.00091	-0.00093	-0.00092
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00064	-0.00064	-0.00063

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)	0.00096	0.00097	0.00093
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00067	0.00064

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00286	0.00296	0.00248	0.37856

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.06132	0.16290

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)	0.11303	1.08712	10.91970
	A1->Y (FR)	0.13731	1.11019	10.65330
	B0->Y (FR)	0.06282	0.83269	8.94149

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)	0.08702	0.86573	8.73071
	A1->Y (RF)	0.10904	0.87419	8.61932
	B0->Y (RF)	0.06873	0.88266	9.32817

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	0.00492	0.00476	0.00553
	A1	0.00000	0.00000	0.00000
	A1	0.00595	0.00585	0.00618
	B0	0.00404	0.00391	0.00524

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	0.00023	0.00014	0.00039
	A1	0.00000	0.00000	0.00000
	A1	0.00121	0.00100	0.00126
	B0	0.00158	0.00149	0.00185

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00093	-0.00094	-0.00092
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00193	-0.00196	-0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00200	-0.00201	-0.00200

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00098	0.00097	0.00094
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00194	0.00196	0.00195
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00201	0.00202	0.00201

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00155	-0.00188	-0.00187
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00191	-0.00195	-0.00194
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00198	-0.00198	-0.00198

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)	0.00186	0.00188	0.00187
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00193	0.00195	0.00194
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00198	0.00200	0.00199

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)	-0.00160	-0.00161	-0.00165

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)	0.00165	0.00166	0.00166

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00270	0.00282	0.00301	0.00297	0.39230

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.01005	0.02316

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)	0.14684	1.11442	10.69790
	A1->Y (FR)	0.12630	1.09943	10.97760
	B0->Y (FR)	0.08737	1.06016	10.94080
	B1->Y (FR)	0.10976	1.07311	10.66340

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)	0.14550	0.94770	9.00570
	A1->Y (RF)	0.11717	0.91375	8.94218
	B0->Y (RF)	0.10079	0.93080	9.54630
	B1->Y (RF)	0.13040	0.96359	9.61308

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	0.00759	0.00750	0.00783
	A1	0.00655	0.00641	0.00714
	B0	0.00484	0.00484	0.00550
	B1	0.00594	0.00584	0.00621

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00185	0.00166	0.00190
	A1	0.00097	0.00086	0.00107
	B0	0.00095	0.00085	0.00122
	B1	0.00186	0.00168	0.00204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00158	-0.00190	-0.00189
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00158	-0.00190	-0.00189
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00185	-0.00189	-0.00188
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00192	-0.00193	-0.00193

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00189	0.00190	0.00189
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00189	0.00190	0.00189
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00188	0.00189	0.00188
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00193	0.00196	0.00193

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)	-0.00090	-0.00091	-0.00090
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00090	-0.00091	-0.00090
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00185	-0.00187	-0.00187
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00192	-0.00193	-0.00192

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)	0.00094	0.00094	0.00091
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00094	0.00094	0.00091
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00186	0.00187	0.00187
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00193	0.00193	0.00193

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00090	-0.00091	-0.00091
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00090	-0.00091	-0.00091
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00214	-0.00217	-0.00216
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00214	-0.00216	-0.00221

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)	0.00095	0.00095	0.00092
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00095	0.00096	0.00092
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00216	0.00217	0.00216
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00221	0.00223	0.00222

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00157	-0.00189	-0.00188
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00157	-0.00188	-0.00188
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00218	-0.00222	-0.00222
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00217	-0.00219	-0.00225

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)	0.00188	0.00189	0.00188
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00188	0.00188	0.00188
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00221	0.00222	0.00222
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00225	0.00230	0.00226

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00318	0.00295	0.76135
sky130_osu_sc_12T_ms__or2_2	0.00318	0.00295	1.54468
sky130_osu_sc_12T_ms__or2_4	0.00318	0.00295	3.07848
sky130_osu_sc_12T_ms__or2_8	0.00317	0.00295	6.04696
sky130_osu_sc_12T_ms__or2_l	0.00234	0.00220	0.55215

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.01303	0.01627
sky130_osu_sc_12T_ms__or2_2	0.00000	0.01534	0.02532
sky130_osu_sc_12T_ms__or2_4	0.00000	0.02286	0.04825
sky130_osu_sc_12T_ms__or2_8	0.00000	0.03790	0.09412
sky130_osu_sc_12T_ms__or2_l	0.00000	0.09238	0.15165

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)	0.12020	0.91382	8.22522
	B->Y (RR)	0.10415	0.86775	8.01016
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.12817	0.81709	8.32798
	B->Y (RR)	0.11172	0.77871	8.15941
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.16438	0.80574	8.73327
	B->Y (RR)	0.14754	0.77454	8.59081
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.23513	0.86510	9.28594
	B->Y (RR)	0.21796	0.84320	9.16701
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.12766	0.98243	8.25089
	B->Y (RR)	0.11165	0.94074	8.09824

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)	0.21239	0.87808	6.51695
	B->Y (FF)	0.18250	0.84714	6.36778
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.25327	0.87141	6.92409
	B->Y (FF)	0.22365	0.85058	6.78000
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.35864	0.96351	7.55785
	B->Y (FF)	0.32918	0.94456	7.47866
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.57071	1.19377	8.31768
	B->Y (FF)	0.54129	1.17457	8.34034
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.22188	0.95095	6.57382
	B->Y (FF)	0.19498	0.91385	6.37838

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	0.00366	0.00329	0.00639
	B	0.00000	0.00000	0.00000
	B	0.00272	0.00245	0.00613
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00599	0.00586	0.00888
	B	0.00000	0.00000	0.00000
	B	0.00501	0.00504	0.00861
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01128	0.01158	0.01460
	B	0.00000	0.00000	0.00000
	B	0.01031	0.01080	0.01423
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02205	0.02289	0.02684
	B	0.00000	0.00000	0.00000
	B	0.02107	0.02212	0.02649
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00276	0.00251	0.00490
	B	0.00000	0.00000	0.00000
	B	0.00210	0.00189	0.00518

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	0.00769	0.00750	0.01024
	B	0.00000	0.00000	0.00000
	B	0.00641	0.00650	0.01102
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00926	0.00947	0.01204
	B	0.00000	0.00000	0.00000
	B	0.00803	0.00839	0.01269
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01335	0.01405	0.01657
	B	0.00000	0.00000	0.00000
	B	0.01207	0.01293	0.01713
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02257	0.02293	0.02603
	B	0.00000	0.00000	0.00000
	B	0.02129	0.02176	0.02630
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00561	0.00549	0.00794
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00489	0.00930

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)	-0.00163	-0.00194	-0.00195
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00163	-0.00194	-0.00195
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00163	-0.00194	-0.00195
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00163	-0.00197	-0.00195
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00103	-0.00130	-0.00131

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)	0.00194	0.00194	0.00195
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00194	0.00194	0.00195
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00194	0.00194	0.00195
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00194	0.00197	0.00195
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00131	0.00132	0.00132

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00092
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00092
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00094	-0.00092
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00093	-0.00093	-0.00092
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00062	-0.00063	-0.00062

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00098	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00098	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00098	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00098	0.00098	0.00094
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00063

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00307	0.00397	0.39267
sky130_osu_sc_12T_ms__tbufi_l	0.00231	0.00297	0.28195

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.01069	0.02778
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.07793	0.29801

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)	0.07605	1.04963	10.93410
	OE->Y (FR)	0.07057	0.34738	4.68815
	OE->Y (RR)	0.13544	1.02385	7.88507
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.08592	1.10639	10.50340
	OE->Y (FR)	0.06885	0.34717	4.68809
	OE->Y (RR)	0.14427	1.12690	8.07456

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)	0.06410	0.86660	9.29278
	OE->Y (FF)	0.07212	0.34739	4.68816
	OE->Y (RF)	0.05743	0.82977	8.74898
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.07393	0.95941	9.47113
	OE->Y (FF)	0.07007	0.34716	4.68811
	OE->Y (RF)	0.06583	0.92235	8.96718

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	0.00340	0.00339	0.00406
	OE	0.00000	0.00000	0.00000
	OE	0.00332	0.00299	0.00774
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00252	0.00243	0.00334
	OE	0.00000	0.00000	0.00000
	OE	0.00239	0.00212	0.00649

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00042	-0.00047	-0.00007
	OE	0.00000	0.00000	0.00000
	OE	0.00209	0.00173	0.00680
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00024	-0.00028	-0.00006
	OE	0.00000	0.00000	0.00000
	OE	0.00146	0.00118	0.00584

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)	-0.00157	-0.00158	-0.00157
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00139	-0.00139	-0.00138
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00111	-0.00112	-0.00111
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00098	-0.00100	-0.00098

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)	0.00157	0.00158	0.00157
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00141	0.00143	0.00140
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00111	0.00112	0.00111
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00101	0.00102	0.00099

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00124	0.00096	0.00599
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00108	0.00077	0.00580
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00088	0.00067	0.00529
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00073	0.00050	0.00512

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)	0.00406	0.00385	0.00912
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00413	0.00394	0.00921
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00306	0.00302	0.00811
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00307	0.00306	0.00817

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00307	0.00462	0.39270
sky130_osu_sc_12T_ms__tnbufi_l	0.00221	0.00343	0.28224

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.01455	0.01720
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.12687	0.15196

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)	0.07696	1.04967	10.93460
	OE->Y (RR)	0.04592	0.34737	4.68846
	OE->Y (FR)	0.09025	1.05508	10.64330
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.08458	1.10531	10.50730
	OE->Y (RR)	0.05152	0.34708	4.68819
	OE->Y (FR)	0.09584	1.12697	10.36720

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)	0.06279	0.86666	9.29261
	OE->Y (RF)	0.04519	0.34737	4.68851
	OE->Y (FF)	0.10269	0.78142	5.71439
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.07058	0.95637	9.47420
	OE->Y (RF)	0.05120	0.34709	4.68820
	OE->Y (FF)	0.11312	0.84740	5.45836

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	0.00352	0.00350	0.00417
	OE	0.00000	0.00000	0.00000
	OE	0.00832	0.00835	0.01400
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00258	0.00249	0.00340
	OE	0.00000	0.00000	0.00000
	OE	0.00619	0.00627	0.01167

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	-0.00058	-0.00061	-0.00022
	OE	0.00000	0.00000	0.00000
	OE	0.00720	0.00724	0.01268
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00044	-0.00021
	OE	0.00000	0.00000	0.00000
	OE	0.00536	0.00547	0.01072

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)	-0.00130	-0.00131	-0.00130
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00113	-0.00114	-0.00113
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00087	-0.00088	-0.00088
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00075	-0.00077	-0.00076

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)	0.00130	0.00131	0.00130
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00116	0.00117	0.00114
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00087	0.00088	0.00088
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00079	0.00079	0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00213	-0.00270	0.00252
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00215	-0.00268	0.00254
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00140	-0.00184	0.00291
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00146	-0.00186	0.00291

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)	0.00621	0.00630	0.01188
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00611	0.00617	0.01178
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00468	0.00481	0.01013
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00462	0.00474	0.01004

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xnor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_l	0.00615	0.00527	0.40340

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.02814	0.03969

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	0.17223	1.08281	8.13346
	A->Y (FR)	!B	0.10181	1.08280	11.06600
	B->Y (RR)	A	0.14195	1.05270	8.10815
	B->Y (FR)	!A	0.12251	1.09174	10.78150

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	0.18246	0.92527	6.20242
	A->Y (RF)	!B	0.08541	0.86167	8.91414
	B->Y (FF)	A	0.15218	0.89622	6.17531
	B->Y (RF)	!A	0.10704	0.88893	8.94109

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	0.00349	0.00304	0.00767
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00858	0.00838	0.01446
	B	A	0.00000	0.00000	0.00000
	B	A	0.00153	0.00128	0.00627
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00907	0.00896	0.01468

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	0.01004	0.00963	0.01480
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00221	0.00173	0.00690
	B	A	0.00000	0.00000	0.00000
	B	A	0.00900	0.00905	0.01443
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00288	0.00236	0.00757

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00617	0.00531	0.39169

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.02814	0.04372

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	0.17399	1.09469	8.21873
	A->Y (FR)	B	0.12497	1.10386	10.86270
	B->Y (RR)	!A	0.14785	1.07512	8.20461
	B->Y (FR)	A	0.13579	1.11690	10.87430

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	0.16487	0.89866	6.03594
	A->Y (RF)	B	0.09678	0.90742	9.32074
	B->Y (FF)	!A	0.15646	0.89406	6.05194
	B->Y (RF)	A	0.10362	0.87998	8.79065

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	0.00983	0.00965	0.01530
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00204	0.00132	0.00611
	B	A	0.00000	0.00000	0.00000
	B	A	0.00998	0.00983	0.01551
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00144	0.00115	0.00609

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	0.00192	0.00133	0.00655
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01029	0.01024	0.01526
	B	A	0.00000	0.00000	0.00000
	B	A	0.00195	0.00139	0.00650
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00912	0.00922	0.01453

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.22224
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	82145.40000	164291.00000
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
	-0.00148	0.02059	0.28721

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	1.43043	1.35360	0.35206