sky130_osu_sc_12T_ms_tt_1P80_150C.ccs Library

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

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ms__addf_1	0.01158	0.01158	0.00885	1.46852	0.63705	1.29476
sky130_osu_sc_12T_ms__addf_l	0.01158	0.01158	0.00886	0.99872	0.63774	1.29473

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	88.87550	103.48400
sky130_osu_sc_12T_ms__addf_l	0.00000	122.10700	169.97500

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)	0.15175	1.69543	26.03290
	B->CO (RR)	0.15358	1.69169	25.86090
	CI->CO (RR)	0.14226	1.73604	26.80490
	CON->CO (FR)	0.02139	0.62683	10.01450
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.15163	1.55734	20.71950
	B->CO (RR)	0.15358	1.56285	20.83850
	CI->CO (RR)	0.14213	1.59853	21.51540
	CON->CO (FR)	0.02505	0.67751	9.79923

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)	0.18868	2.01102	30.78610
	B->CO (FF)	0.17016	1.92839	29.57550
	CI->CO (FF)	0.16695	2.03113	31.47180
	CON->CO (RF)	0.02312	0.61856	9.85868
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.18370	1.78447	23.55730
	B->CO (FF)	0.16248	1.70678	22.85310
	CI->CO (FF)	0.16195	1.80570	24.26090
	CON->CO (RF)	0.02547	0.63948	9.24159

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)	0.13848	0.78913	8.61581
	B->CON (FR)	0.11857	0.76111	8.73291
	CI->CON (FR)	0.11680	0.81241	9.35675
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.13156	0.78273	8.61580
	B->CON (FR)	0.11240	0.75540	8.73291
	CI->CON (FR)	0.10985	0.80106	9.35674

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)	0.11019	0.64935	7.24599
	B->CON (RF)	0.11224	0.68022	7.81419
	CI->CON (RF)	0.10070	0.69234	8.09848
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.10612	0.64561	7.24715
	B->CON (RF)	0.10831	0.67674	7.81498
	CI->CON (RF)	0.09659	0.68864	8.09963

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)	0.27741	1.77868	23.21360
	B->S (-R)	0.29756	1.77558	22.43530
	CI->S (-R)	0.25396	1.79573	23.90310
	CON->S (RR)	0.07995	0.61620	7.36708
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.26752	1.77086	23.20540
	B->S (-R)	0.28743	1.76829	22.42780
	CI->S (-R)	0.24406	1.78768	23.89350
	CON->S (RR)	0.07998	0.61618	7.36550

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)	0.25501	1.54393	19.27150
	B->S (-F)	0.25077	1.50206	19.08080
	CI->S (-F)	0.24648	1.58351	20.06630
	CON->S (FF)	0.09874	0.62125	6.76125
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.24839	1.53891	19.26560
	B->S (-F)	0.24438	1.49718	19.07520
	CI->S (-F)	0.23975	1.57866	20.06080
	CON->S (FF)	0.09879	0.62119	6.76044

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	0.00421	0.00661	0.05356
	B	0.00546	0.00762	0.05104
	CI	0.00560	0.00814	0.05487
sky130_osu_sc_12T_ms__addf_l	A	0.00371	0.00556	0.03902
	B	0.00498	0.00663	0.03796
	CI	0.00510	0.00716	0.04035

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01144	0.01518	0.08614
	B	0.01172	0.01484	0.07850
	CI	0.00996	0.01389	0.08539
sky130_osu_sc_12T_ms__addf_l	A	0.01168	0.01431	0.06069
	B	0.01198	0.01414	0.05564
	CI	0.01020	0.01304	0.05982

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01081	0.01299	0.04831
	B	0.01117	0.01298	0.04469
	CI	0.00934	0.01171	0.04740
sky130_osu_sc_12T_ms__addf_l	A	0.01111	0.01308	0.04602
	B	0.01144	0.01304	0.04261
	CI	0.00966	0.01169	0.04512

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00357	0.00504	0.03040
	B	0.00484	0.00611	0.03100
	CI	0.00497	0.00655	0.03222
sky130_osu_sc_12T_ms__addf_l	A	0.00323	0.00468	0.02980
	B	0.00450	0.00576	0.03052
	CI	0.00462	0.00619	0.03172

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01111	0.01456	0.07756
	B	0.00503	0.00470	0.06167
	CI	0.00963	0.01327	0.07662
sky130_osu_sc_12T_ms__addf_l	A	0.00286	0.00226	0.06377
	B	0.00503	0.00470	0.06165
	CI	0.00629	0.00724	0.06374

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.02336	0.02487	0.08221
	B	0.02089	0.02241	0.07711
	CI	0.01807	0.01983	0.07247
sky130_osu_sc_12T_ms__addf_l	A	0.02336	0.02487	0.08221
	B	0.02245	0.02392	0.07862
	CI	0.02061	0.02169	0.07312

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00568	0.00599	1.41066	1.44306	1.46795
sky130_osu_sc_12T_ms__addh_l	0.00568	0.00599	0.98166	1.44092	1.02161

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	99.73570	103.56500
sky130_osu_sc_12T_ms__addh_l	0.00000	166.10700	170.02400

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)	0.09991	0.63795	7.54824
	B->CO (RR)	0.10336	0.61976	7.54179
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.09888	0.68054	7.47092
	B->CO (RR)	0.10235	0.66388	7.41936

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)	0.07865	0.59002	7.02997
	B->CO (FF)	0.08336	0.60742	7.21146
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.07774	0.61291	6.60186
	B->CO (FF)	0.08226	0.63107	6.79735

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)	0.13762	0.65516	7.50077
	B->CON (RR)	0.13998	0.63555	7.50978
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.12747	0.64002	7.49850
	B->CON (RR)	0.12993	0.62185	7.46902

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)	0.11310	0.61771	7.17033
	B->CON (FF)	0.10970	0.62759	7.31805
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.10489	0.59823	7.03589
	B->CON (FF)	0.10173	0.60812	7.19012

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)	0.14925	1.27417	17.73670
	B->S (FR)	0.14537	1.28535	17.94490
	CON->S (FR)	0.02281	0.63613	10.16050
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.14363	1.19247	14.40720
	B->S (FR)	0.13980	1.20254	14.57960
	CON->S (FR)	0.02569	0.68670	9.99462

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)	0.17598	1.33580	18.45330
	B->S (RF)	0.17834	1.31465	18.45000
	CON->S (RF)	0.02277	0.61646	9.88801
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.16715	1.23267	14.82620
	B->S (RF)	0.16959	1.21312	14.77740
	CON->S (RF)	0.02496	0.64509	9.41037

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	0.00585	0.00680	0.03119
	B	0.00000	0.00000	0.00000
	B	0.00533	0.00619	0.03572
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00582	0.00666	0.03040
	B	0.00000	0.00000	0.00000
	B	0.00531	0.00605	0.03378

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	0.00758	0.00870	0.03793
	B	0.00000	0.00000	0.00000
	B	0.00801	0.00957	0.04080
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00744	0.00850	0.03624
	B	0.00000	0.00000	0.00000
	B	0.00787	0.00931	0.03871

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	0.00584	0.00680	0.03146
	B	0.00000	0.00000	0.00000
	B	0.00533	0.00619	0.03577
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00582	0.00667	0.03095
	B	0.00000	0.00000	0.00000
	B	0.00532	0.00606	0.03411

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	0.00758	0.00871	0.03797
	B	0.00000	0.00000	0.00000
	B	0.00802	0.00958	0.04092
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00752	0.00860	0.03744
	B	0.00000	0.00000	0.00000
	B	0.00795	0.00944	0.04001

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	0.00787	0.00900	0.03858
	B	0.00000	0.00000	0.00000
	B	0.00834	0.00992	0.04158
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00790	0.00895	0.03698
	B	0.00000	0.00000	0.00000
	B	0.00836	0.00980	0.03949

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	0.00607	0.00706	0.03190
	B	0.00000	0.00000	0.00000
	B	0.00556	0.00644	0.03657
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00596	0.00683	0.03066
	B	0.00000	0.00000	0.00000
	B	0.00545	0.00621	0.03433

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.68679	1.61893	0.62263
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.68741	1.61956	0.62334

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.68685	1.62150	0.67791
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.68747	1.62215	0.67861

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00304	0.00315	1.40610
sky130_osu_sc_12T_ms__and2_2	0.00304	0.00316	2.80010
sky130_osu_sc_12T_ms__and2_4	0.00304	0.00316	5.33961
sky130_osu_sc_12T_ms__and2_6	0.00307	0.00315	8.02365
sky130_osu_sc_12T_ms__and2_8	0.00304	0.00316	10.37909
sky130_osu_sc_12T_ms__and2_l	0.00228	0.00237	0.99609

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	43.11700	68.73800
sky130_osu_sc_12T_ms__and2_2	0.00000	68.75930	68.88050
sky130_osu_sc_12T_ms__and2_4	0.00000	120.23800	137.28100
sky130_osu_sc_12T_ms__and2_6	0.00000	171.71600	205.79600
sky130_osu_sc_12T_ms__and2_8	0.00000	223.19200	274.30900
sky130_osu_sc_12T_ms__and2_l	0.00000	126.22600	201.68200

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)	0.07604	0.58240	7.48817
	B->Y (RR)	0.08132	0.56583	7.16217
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.08659	0.53131	7.56830
	B->Y (RR)	0.09190	0.51074	7.23234
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.11979	0.54042	7.62779
	B->Y (RR)	0.12517	0.51280	7.28880
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.15496	0.57774	7.87997
	B->Y (RR)	0.16017	0.54630	7.53603
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.18897	0.61531	7.94828
	B->Y (RR)	0.19436	0.58070	7.59235
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.07902	0.64041	7.62921
	B->Y (RR)	0.08421	0.62089	7.27376

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)	0.06370	0.52750	6.48932
	B->Y (FF)	0.06489	0.53676	6.59148
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.07114	0.48006	6.59956
	B->Y (FF)	0.07222	0.48684	6.70934
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.09885	0.48797	6.67577
	B->Y (FF)	0.09800	0.49006	6.77111
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.12893	0.52520	6.90410
	B->Y (FF)	0.12598	0.52322	7.00519
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.15759	0.55796	6.89824
	B->Y (FF)	0.15288	0.55317	6.99049
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.06395	0.55603	6.24768
	B->Y (FF)	0.06811	0.57332	6.41443

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	0.00510	0.00815	0.08457
	B	0.00000	0.00000	0.00000
	B	0.00511	0.00726	0.06777
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00845	0.01120	0.08781
	B	0.00000	0.00000	0.00000
	B	0.00848	0.01044	0.07097
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01701	0.01881	0.09301
	B	0.00000	0.00000	0.00000
	B	0.01706	0.01802	0.07798
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02827	0.02745	0.10176
	B	0.00000	0.00000	0.00000
	B	0.02820	0.02621	0.08579
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04123	0.03696	0.11014
	B	0.00000	0.00000	0.00000
	B	0.04135	0.03473	0.09119
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00795	0.01096	0.08295
	B	0.00000	0.00000	0.00000
	B	0.00795	0.01020	0.07266

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	0.00914	0.01319	0.08337
	B	0.00000	0.00000	0.00000
	B	0.01025	0.01408	0.08327
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01246	0.01638	0.08627
	B	0.00000	0.00000	0.00000
	B	0.01355	0.01715	0.08625
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02144	0.02431	0.09283
	B	0.00000	0.00000	0.00000
	B	0.02233	0.02498	0.09305
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03232	0.03286	0.10049
	B	0.00000	0.00000	0.00000
	B	0.03290	0.03320	0.10020
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04500	0.04183	0.10776
	B	0.00000	0.00000	0.00000
	B	0.04512	0.04172	0.10715
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00851	0.01243	0.08063
	B	0.00000	0.00000	0.00000
	B	0.00931	0.01314	0.08121

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)	-0.00264	-0.00267	-0.00268
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00234	-0.00237	-0.00238
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00175	-0.00178	-0.00178
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00118	-0.00121	-0.00122
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00056	-0.00059	-0.00059
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00117	-0.00120	-0.00120

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)	0.00329	0.00331	0.00329
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00359	0.00361	0.00358
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00418	0.00420	0.00418
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00480	0.00483	0.00481
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00537	0.00539	0.00538
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00296	0.00298	0.00297

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)	-0.00252	-0.00253	-0.00252
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00222	-0.00223	-0.00222
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00163	-0.00164	-0.00163
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00103	-0.00105	-0.00103
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00044	-0.00046	-0.00044
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00110	-0.00111	-0.00110

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)	0.00324	0.00315	0.00313
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00354	0.00348	0.00343
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00414	0.00405	0.00403
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00473	0.00465	0.00463
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00533	0.00525	0.00522
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00294	0.00288	0.00287

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__aoi21_l	0.00281	0.00297	0.00292	0.59565

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	19.35690	43.78540

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)	0.07216	0.72441	8.38228
	A1->Y (FR)	0.05742	0.66444	7.87811
	B0->Y (FR)	0.05399	0.75776	9.28043

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)	0.05799	0.57228	6.74288
	A1->Y (RF)	0.05393	0.60871	7.45177
	B0->Y (RF)	0.03074	0.53486	6.81560

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	0.00732	0.00788	0.02920
	A1	0.00000	0.00000	0.00000
	A1	0.00616	0.00670	0.02712
	B0	0.00438	0.00591	0.03141

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	0.00250	0.00286	0.01897
	A1	0.00000	0.00000	0.00000
	A1	0.00259	0.00319	0.02021
	B0	0.00003	0.00121	0.01924

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)	-0.00173	-0.00224	-0.00218
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00219	-0.00220	-0.00219
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00249	-0.00249	-0.00249

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)	0.00280	0.00281	0.00277
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00279	0.00281	0.00279
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00261	0.00253	0.00250

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)	-0.00171	-0.00224	-0.00218
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00218	-0.00220	-0.00219
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00271	-0.00272	-0.00274

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)	0.00281	0.00282	0.00278
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00279	0.00282	0.00280
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00274	0.00279	0.00275

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)	-0.00095	-0.00098	-0.00094

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)	0.00155	0.00155	0.00137

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__aoi22_l	0.00281	0.00297	0.00310	0.00291	0.57701

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi22_l	0.00000	21.83070	68.40110

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)	0.09180	0.74043	8.24916
	A1->Y (FR)	0.08184	0.72652	8.19395
	B0->Y (FR)	0.05682	0.75133	9.09381
	B1->Y (FR)	0.06719	0.76704	9.16390

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)	0.07660	0.58580	6.63174
	A1->Y (RF)	0.07240	0.61969	7.33868
	B0->Y (RF)	0.03762	0.58384	7.29618
	B1->Y (RF)	0.04273	0.54797	6.58865

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	0.00901	0.00949	0.03120
	A1	0.00785	0.00831	0.02937
	B0	0.00478	0.00622	0.03099
	B1	0.00598	0.00706	0.03220

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00422	0.00456	0.02175
	A1	0.00429	0.00495	0.02279
	B0	0.00099	0.00190	0.01912
	B1	0.00099	0.00159	0.01789

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)	-0.00148	-0.00209	-0.00190
	(!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)	-0.00249	-0.00250	-0.00248
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00248	-0.00250	-0.00248

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)	0.00311	0.00310	0.00303
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00309	0.00309	0.00309
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00261	0.00253	0.00250
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00261	0.00253	0.00250

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)	-0.00147	-0.00208	-0.00191
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00189	-0.00191	-0.00190
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00270	-0.00271	-0.00273
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00270	-0.00271	-0.00273

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)	0.00311	0.00311	0.00303
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00309	0.00310	0.00309
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00273	0.00279	0.00274
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00273	0.00278	0.00274

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)	-0.00095	-0.00097	-0.00093
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00055	-0.00057	-0.00058
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00281	-0.00283	-0.00284
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00281	-0.00283	-0.00284

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)	0.00159	0.00159	0.00136
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00134	0.00134	0.00132
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00284	0.00285	0.00286
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00285	0.00286	0.00286

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)	-0.00097	-0.00099	-0.00095
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00057	-0.00058	-0.00060
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00261	-0.00262	-0.00261
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00261	-0.00262	-0.00261

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00160	0.00160	0.00138
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00135	0.00136	0.00134
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00273	0.00266	0.00262
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00273	0.00266	0.00262

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00316	1.31712
sky130_osu_sc_12T_ms__buf_2	0.00316	2.66896
sky130_osu_sc_12T_ms__buf_4	0.00316	5.32218
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00316	10.38962
sky130_osu_sc_12T_ms__buf_l	0.00233	0.99138

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	34.61010	34.61300
sky130_osu_sc_12T_ms__buf_2	0.00000	51.75450	68.75930
sky130_osu_sc_12T_ms__buf_4	0.00000	86.20430	137.27900
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	155.10300	274.31500
sky130_osu_sc_12T_ms__buf_l	0.00000	101.08600	101.09800

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)**	0.05691	0.54369	6.92331
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.06149	0.47097	6.83571
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.08220	0.46620	7.05708
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.12530	0.51476	7.30000
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.05904	0.58715	7.02894

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)**	0.05943	0.50920	6.27183
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.06727	0.47011	6.50626
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.09467	0.48510	6.82563
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.15268	0.55477	7.06759
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.06183	0.55856	6.45575

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	0.00397	0.00679	0.06433
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00704	0.00991	0.07472
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01451	0.01756	0.07557
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03313	0.03424	0.09460
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00504	0.00824	0.07759

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	0.00873	0.01271	0.08436
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01197	0.01582	0.08701
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02082	0.02352	0.09331
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04410	0.04060	0.10685
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00839	0.01259	0.08610

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
	-0.00070	-0.00070	-0.00066

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
	0.00070	0.00070	0.00066

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffnr_1	0.00293	0.00290	0.00928	1.40757	1.40027
sky130_osu_sc_12T_ms__dffnr_l	0.00293	0.00290	0.00928	1.00646	0.99587

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	165.39200	257.14300
sky130_osu_sc_12T_ms__dffnr_l	0.00000	231.86900	323.62700

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)	0.34032	1.43673	16.70640
	QN->Q (FR)	0.02479	0.69751	11.04180
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.33577	1.53129	16.27170
	QN->Q (FR)	0.02704	0.73006	10.58250

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)	0.22179	1.31780	17.14730
	QN->Q (RF)	0.02480	0.65632	10.35970
	RN->Q (FF)	0.21281	1.33056	17.25020
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.22397	1.44219	16.92670
	QN->Q (RF)	0.02656	0.67757	9.83271
	RN->Q (FF)	0.21552	1.45396	17.02470

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)	0.18816	0.67913	6.96440
	RN->QN (FR)	0.17909	0.69225	7.06801
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.18685	0.73220	6.99010
	RN->QN (FR)	0.17794	0.74535	7.09250

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)**	0.30617	0.81908	6.85524
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.29837	0.84210	6.61716

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)	-0.11495	-0.23468	-2.65324
	setup	CK (F)	0.16903	0.24923	2.73288
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11641	-0.23474	-2.65574
	setup	CK (F)	0.16950	0.24923	2.73388

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)	-0.06950	-0.06774	0.13589
	setup	CK (F)	0.16780	0.20433	0.40759
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06809	-0.06551	0.13631
	setup	CK (F)	0.16650	0.20388	0.41422

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)	-0.11495	-0.23468	-2.65324
	setup	CK (F)	0.16903	0.24923	2.73288
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11641	-0.23474	-2.65574
	setup	CK (F)	0.16950	0.24923	2.73388

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)	-0.06950	-0.06774	0.13589
	setup	CK (F)	0.16780	0.20433	0.40759
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06809	-0.06551	0.13631
	setup	CK (F)	0.16650	0.20388	0.41422

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)	0.13004	0.15035	0.32363
	removal	CK (F)	-0.10123	-0.13726	-0.27334
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.13341	0.15052	0.32791
	removal	CK (F)	-0.10123	-0.13726	-0.27334

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)	0.13004	0.15035	0.32363
	removal	CK (F)	-0.10123	-0.13726	-0.27334
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.13341	0.15052	0.32791
	removal	CK (F)	-0.10123	-0.13726	-0.27334

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 ()	0.12749	0.43945	13.33370
	min_pulse_width	RN ()	0.12417	0.43945	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.12085	0.43945	13.33370
	min_pulse_width	RN ()	0.12085	0.43945	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 ()	0.15736	0.43945	13.33370
	min_pulse_width	CK ()	0.21046	0.43945	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.15736	0.43945	13.33370
	min_pulse_width	CK ()	0.21046	0.43945	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 ()	0.15736	0.43945	13.33370
	min_pulse_width	CK ()	0.10757	0.43945	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.15072	0.43945	13.33370
	min_pulse_width	CK ()	0.10426	0.43945	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	0.01808	0.01914	0.05136
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01827	0.01982	0.06119

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	0.01938	0.02161	0.07035
	RN	-0.00102	-0.06891	-1.14009
	RN	0.02213	0.02279	0.04948
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01946	0.02237	0.08291
	RN	-0.00102	-0.05635	-0.81515
	RN	0.02222	0.02351	0.06286

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	0.01868	0.02095	0.06908
	RN	-0.00102	-0.06870	-1.13388
	RN	0.02141	0.02209	0.04848
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01869	0.02157	0.08177
	RN	-0.00102	-0.05599	-0.80649
	RN	0.02150	0.02280	0.06125

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	0.01745	0.01851	0.05053
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01724	0.01878	0.05996

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)	0.01187	0.01372	0.08255
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00543	0.00726	0.07192
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00100	-0.00148	-0.00139
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)	0.01245	0.01430	0.08313
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00601	0.00784	0.07250
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00042	-0.00090	-0.00081

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)	0.01844	0.02071	0.08925
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00975	0.01197	0.07836
	!CK	0.00000	0.00000	0.00000
	!CK	0.00407	0.00410	0.00403
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)	0.01901	0.02129	0.08983
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.01032	0.01255	0.07894
	!CK	0.00000	0.00000	0.00000
	!CK	0.00465	0.00468	0.00461

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)	0.01213	0.01550	0.10752
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00538	0.00855	0.09461
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01271	0.01608	0.10810
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00595	0.00913	0.09519

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)	0.01817	0.02209	0.11295
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00901	0.01317	0.10053
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01875	0.02265	0.11353
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00959	0.01375	0.10111

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)	0.00086	0.00378	0.09136
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01273	0.01831	0.14376
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00485	0.01056	0.16632
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01546	0.01821	0.14513
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00182	0.00478	0.09205
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00144	0.00436	0.09194
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01330	0.01889	0.14434
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00543	0.01114	0.16690
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01604	0.01879	0.14571
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00240	0.00536	0.09263

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)	0.01345	0.01755	0.10569
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01717	0.02458	0.18182
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01566	0.01952	0.10716
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01402	0.01813	0.10626
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01774	0.02516	0.18240
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01624	0.02010	0.10774

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00293	0.00290	0.00888	1.38871	1.40035
sky130_osu_sc_12T_ms__dffr_l	0.00293	0.00290	0.00887	0.98895	0.99689

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	165.39200	257.25200
sky130_osu_sc_12T_ms__dffr_l	0.00000	231.86900	323.73500

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)	0.27587	1.35040	16.37760
	QN->Q (FR)	0.02479	0.69407	10.94450
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.27108	1.44149	15.89080
	QN->Q (FR)	0.02704	0.72499	10.46050

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)	0.28795	1.38501	17.04910
	QN->Q (RF)	0.02479	0.65312	10.27170
	RN->Q (FF)	0.21304	1.32317	17.03230
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.29004	1.50520	16.76850
	QN->Q (RF)	0.02656	0.67309	9.72342
	RN->Q (FF)	0.21540	1.44389	16.74400

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)	0.25429	0.75436	7.08833
	RN->QN (FR)	0.17921	0.69291	7.06987
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.25286	0.80846	7.12776
	RN->QN (FR)	0.17815	0.74620	7.10060

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)**	0.24169	0.74085	6.74519
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.23367	0.76403	6.51003

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)	-0.07196	-0.07143	0.07788
	setup	CK (R)	0.21302	0.23146	0.45910
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07040	-0.07143	0.07741
	setup	CK (R)	0.21261	0.23186	0.44518

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)	-0.10901	-0.23025	-2.43901
	setup	CK (R)	0.13086	0.24078	2.49942
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.10920	-0.23028	-2.43826
	setup	CK (R)	0.13086	0.24078	2.49942

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)	-0.07196	-0.07143	0.07788
	setup	CK (R)	0.21302	0.23146	0.45910
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07040	-0.07143	0.07741
	setup	CK (R)	0.21261	0.23186	0.44518

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)	-0.10901	-0.23025	-2.43901
	setup	CK (R)	0.13086	0.24078	2.49942
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.10920	-0.23028	-2.43826
	setup	CK (R)	0.13086	0.24078	2.49942

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)	0.17706	0.20641	0.91219
	removal	CK (R)	-0.03948	-0.04666	-0.07733
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.17436	0.20639	0.91432
	removal	CK (R)	-0.03948	-0.04666	-0.07733

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)	0.17706	0.20641	0.91219
	removal	CK (R)	-0.03948	-0.04666	-0.07733
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.17436	0.20639	0.91432
	removal	CK (R)	-0.03948	-0.04666	-0.07733

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 ()	0.12417	0.43945	13.33370
	min_pulse_width	RN ()	0.12749	0.43945	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.12417	0.43945	13.33370
	min_pulse_width	RN ()	0.12085	0.43945	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 ()	0.13412	0.43945	13.33370
	min_pulse_width	CK ()	0.15072	0.43945	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.12749	0.43945	13.33370
	min_pulse_width	CK ()	0.14740	0.43945	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 ()	0.27020	0.43945	13.33370
	min_pulse_width	CK ()	0.11089	0.43945	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.27020	0.43945	13.33370
	min_pulse_width	CK ()	0.11089	0.43945	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	0.01116	0.01317	0.06257
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01131	0.01375	0.07229

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	0.01383	0.01408	0.03963
	RN	-0.00102	-0.06836	-1.12482
	RN	0.02305	0.02372	0.05070
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01386	0.01473	0.05231
	RN	-0.00102	-0.05576	-0.80097
	RN	0.02317	0.02446	0.06326

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	0.01308	0.01331	0.03851
	RN	-0.00102	-0.06870	-1.13395
	RN	0.02282	0.02348	0.04979
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01309	0.01395	0.05127
	RN	-0.00102	-0.05603	-0.80732
	RN	0.02282	0.02412	0.06254

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	0.01037	0.01239	0.06111
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01014	0.01258	0.07054

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	-0.00048	-0.00097	-0.00086
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01192	0.01375	0.08255
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00596	0.00776	0.07242
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00010	-0.00039	-0.00028
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01250	0.01432	0.08313
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00653	0.00834	0.07300

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	0.00415	0.00418	0.00411
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01781	0.02008	0.08864
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00863	0.01090	0.07727
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00473	0.00476	0.00469
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01839	0.02066	0.08922
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00920	0.01148	0.07785

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)	0.00538	0.00855	0.09462
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01139	0.01475	0.10677
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)	0.00596	0.00913	0.09520
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01197	0.01533	0.10735

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)	0.00901	0.01317	0.10053
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01832	0.02225	0.11310
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)	0.00959	0.01375	0.10111
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01890	0.02283	0.11368

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)	0.00068	0.00368	0.09137
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00626	0.00921	0.10273
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00153	0.00455	0.09198
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00126	0.00426	0.09195
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00684	0.00975	0.10331
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00211	0.00513	0.09256

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)	0.01322	0.01742	0.10564
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02775	0.03133	0.14187
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02121	0.02492	0.11634
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02668	0.03417	0.17422
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01559	0.01956	0.10723
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01380	0.01800	0.10622
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02833	0.03191	0.14245
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02179	0.02550	0.11692
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02726	0.03481	0.17480
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01617	0.02013	0.10781

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ms__dffsr_1	0.00289	0.00291	0.00675	0.00900	1.45567	1.47076
sky130_osu_sc_12T_ms__dffsr_l	0.00289	0.00291	0.00675	0.00900	0.99549	0.99617

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	138.99400	191.65200
sky130_osu_sc_12T_ms__dffsr_l	0.00000	205.46900	258.13500

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)	0.29400	1.38453	16.91090
	QN->Q (FR)	0.02331	0.67137	10.71740
	RN->Q (RR)	0.23791	1.34006	16.95300
	SN->Q (FR)	0.20996	1.30299	16.85580
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.29341	1.47172	16.02330
	QN->Q (FR)	0.02697	0.72669	10.50320
	RN->Q (RR)	0.23765	1.42895	16.06040
	SN->Q (FR)	0.20965	1.38892	15.95740

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)	0.34193	1.45889	17.58520
	QN->Q (RF)	0.02460	0.66401	10.58080
	RN->Q (FF)	0.22287	1.35240	17.55660
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.34563	1.57318	16.94030
	QN->Q (RF)	0.02642	0.67409	9.75257
	RN->Q (FF)	0.22703	1.46670	16.90040

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)	0.30726	0.81517	7.23040
	RN->QN (FR)	0.18854	0.70855	7.19449
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.30744	0.87180	7.19226
	RN->QN (FR)	0.18960	0.76593	7.15001

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)	0.26099	0.77438	7.07936
	RN->QN (RF)	0.20513	0.73042	7.11905
	SN->QN (FF)	0.17721	0.69284	7.02190
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.25629	0.79056	6.53598
	RN->QN (RF)	0.20078	0.74746	6.57188
	SN->QN (FF)	0.17287	0.70702	6.46797

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)	-0.07885	-0.08144	0.04678
	setup	CK (R)	0.22168	0.23984	0.50489
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.07692	-0.07974	0.04793
	setup	CK (R)	0.22119	0.24032	0.50631

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)	-0.12830	-0.24703	-2.49366
	setup	CK (R)	0.16014	0.26188	2.55442
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12877	-0.25055	-2.49500
	setup	CK (R)	0.16014	0.26188	2.55442

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)	-0.07885	-0.08144	0.04678
	setup	CK (R)	0.22168	0.23984	0.50489
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.07692	-0.07974	0.04793
	setup	CK (R)	0.22119	0.24032	0.50631

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)	-0.12830	-0.24703	-2.49366
	setup	CK (R)	0.16014	0.26188	2.55442
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12877	-0.25055	-2.49500
	setup	CK (R)	0.16014	0.26188	2.55442

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)	0.16656	0.19380	0.90036
	removal	CK (R)	-0.02813	-0.03285	-0.04742
	hold	SN (R)	-0.17005	-0.29046	-1.05323
	setup	SN (R)	0.19919	0.33015	3.34358
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.16717	0.19363	0.90419
	removal	CK (R)	-0.02813	-0.03285	-0.04742
	hold	SN (R)	-0.16232	-0.28211	-1.02240
	setup	SN (R)	0.19735	0.32017	3.27384

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)	0.16656	0.19380	0.90036
	removal	CK (R)	-0.02813	-0.03285	-0.04742
	hold	SN (R)	-0.17005	-0.29046	-1.05323
	hold	SN (R)	-0.17087	-0.29209	-1.05506
	setup	SN (R)	0.19919	0.32609	3.08390
	setup	SN (R)	0.19821	0.33015	3.34358
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.16717	0.19363	0.90419
	removal	CK (R)	-0.02813	-0.03285	-0.04742
	hold	SN (R)	-0.16232	-0.28211	-1.02552
	hold	SN (R)	-0.16404	-0.28464	-1.02240
	setup	SN (R)	0.19735	0.31953	2.99496
	setup	SN (R)	0.18932	0.32017	3.27384

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 ()	0.14408	0.43945	13.33370
	min_pulse_width	RN ()	0.14740	0.43945	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.14408	0.43945	13.33370
	min_pulse_width	RN ()	0.14408	0.43945	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)	0.04608	0.07205	2.91063
	removal	CK (R)	-0.02381	-0.05426	-0.29746
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.04577	0.07186	2.78822
	removal	CK (R)	-0.02381	-0.05426	-0.29746

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)	0.04608	0.07205	2.91063
	removal	CK (R)	-0.02381	-0.05426	-0.29746
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.04577	0.07186	2.78822
	removal	CK (R)	-0.02381	-0.05426	-0.29746

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 ()	0.16731	0.43945	13.33370
	min_pulse_width	SN ()	0.17063	0.43945	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.16731	0.43945	13.33370
	min_pulse_width	SN ()	0.16399	0.43945	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 ()	0.14076	0.43945	13.33370
	min_pulse_width	CK ()	0.17063	0.43945	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.13412	0.43945	13.33370
	min_pulse_width	CK ()	0.16731	0.43945	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 ()	0.28015	0.43945	13.33370
	min_pulse_width	CK ()	0.14076	0.43945	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.28015	0.43945	13.33370
	min_pulse_width	CK ()	0.14076	0.43945	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	0.01332	0.01512	0.06304
	RN	0.02187	0.02273	0.05729
	SN	-0.00102	-0.07032	-1.17906
	SN	0.02027	0.02081	0.06056
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01351	0.01581	0.07344
	RN	0.02205	0.02341	0.06775
	SN	-0.00102	-0.05598	-0.80627
	SN	0.02048	0.02153	0.07150

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	0.01453	0.01516	0.04817
	RN	-0.00102	-0.07032	-1.17905
	RN	0.02477	0.02587	0.06049
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01454	0.01536	0.05312
	RN	-0.00102	-0.05598	-0.80627
	RN	0.02481	0.02611	0.06726

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	0.01390	0.01452	0.04641
	RN	-0.00102	-0.07075	-1.19076
	RN	0.02430	0.02541	0.05969
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01390	0.01472	0.05231
	RN	-0.00102	-0.05600	-0.80674
	RN	0.02430	0.02561	0.06564

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	0.01257	0.01437	0.06185
	RN	0.02110	0.02195	0.05605
	SN	-0.00102	-0.07075	-1.19119
	SN	0.01979	0.02031	0.06048
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01231	0.01461	0.07174
	RN	0.02084	0.02221	0.06622
	SN	-0.00102	-0.05600	-0.80678
	SN	0.01960	0.02063	0.07033

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	-0.00085	-0.00086	-0.00085
	(!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)	0.01476	0.01646	0.08445
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00586	0.00761	0.07245
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00587	0.00762	0.07232
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00610	0.00785	0.07261
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00028	-0.00028	-0.00027
	(!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)	0.01534	0.01704	0.08502
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00643	0.00819	0.07302
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00645	0.00820	0.07290
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00668	0.00843	0.07318

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	0.00430	0.00423	0.00420
	(!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)	0.02024	0.02232	0.09029
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00953	0.01171	0.07747
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00950	0.01162	0.07741
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00957	0.01175	0.07761
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00488	0.00481	0.00478
	(!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)	0.02082	0.02290	0.09087
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01011	0.01229	0.07805
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01008	0.01220	0.07799
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01015	0.01233	0.07819

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)	0.00403	0.00719	0.09354
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01263	0.01577	0.10720
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)	0.00461	0.00777	0.09412
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01321	0.01635	0.10777

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)	0.00950	0.01375	0.10099
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01852	0.02244	0.11321
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)	0.01008	0.01433	0.10157
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01910	0.02302	0.11379

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)	-0.00482	-0.00483	-0.00487
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00447	-0.00556	-0.00551
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00435	-0.00488	-0.00486
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00494	0.00657	0.06960
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)	-0.00424	-0.00426	-0.00430
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00390	-0.00498	-0.00493
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00377	-0.00430	-0.00428
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00551	0.00715	0.07017

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)	0.00759	0.00772	0.00763
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00796	0.00798	0.00790
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00766	0.00771	0.00766
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01533	0.01672	0.08004
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)	0.00818	0.00830	0.00821
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00854	0.00856	0.00848
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00824	0.00829	0.00824
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01591	0.01730	0.08062

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)	0.00062	0.00360	0.09127
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00728	0.01010	0.10336
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00737	0.01020	0.10331
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00106	0.00406	0.09146
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00464	0.01013	0.16617
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00120	0.00418	0.09185
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00786	0.01073	0.10394
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00794	0.01078	0.10389
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00164	0.00464	0.09204
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00522	0.01071	0.16675

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)	0.03044	0.03402	0.14375
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01345	0.01761	0.10584
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02110	0.02486	0.11646
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02131	0.02509	0.11673
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02925	0.03641	0.17719
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01506	0.01902	0.10666
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01772	0.02501	0.18210
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03101	0.03459	0.14433
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01403	0.01819	0.10642
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02168	0.02544	0.11704
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02188	0.02567	0.11731
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02983	0.03699	0.17777
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01564	0.01960	0.10724
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01830	0.02559	0.18268

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00291	0.00548	0.00892	1.39188	1.40349
sky130_osu_sc_12T_ms__dffs_l	0.00291	0.00548	0.00892	1.00162	0.99643

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	227.59400	472.67300
sky130_osu_sc_12T_ms__dffs_l	0.00000	294.06400	539.15600

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)	0.21805	1.28001	16.27610
	QN->Q (FR)	0.02474	0.69199	10.91640
	SN->Q (FR)	0.15835	1.25495	16.33930
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.21779	1.38537	15.96510
	QN->Q (FR)	0.02698	0.72658	10.51790
	SN->Q (FR)	0.15839	1.35525	16.00190

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)	0.32318	1.43046	17.11000
	QN->Q (RF)	0.02470	0.65122	10.26050
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.32326	1.55370	16.99440
	QN->Q (RF)	0.02648	0.67473	9.78389

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)	0.28815	0.79895	7.13440
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.28481	0.84822	7.15692

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)	0.18623	0.67129	6.64121
	SN->QN (FF)	0.12603	0.64670	6.70186
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.18265	0.70099	6.39680
	SN->QN (FF)	0.12299	0.67096	6.43258

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)	-0.05858	-0.06167	0.09340
	setup	CK (R)	0.16231	0.18378	0.51108
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.05863	-0.05983	0.09416
	setup	CK (R)	0.16205	0.18399	0.51158

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)	-0.11590	-0.23411	-2.45634
	setup	CK (R)	0.14683	0.24619	2.52878
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11376	-0.23418	-2.45295
	setup	CK (R)	0.14681	0.24619	2.52802

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)	-0.05858	-0.06167	0.09340
	setup	CK (R)	0.16231	0.18378	0.51108
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.05863	-0.05983	0.09416
	setup	CK (R)	0.16205	0.18399	0.51158

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)	-0.11590	-0.23411	-2.45634
	setup	CK (R)	0.14683	0.24619	2.52878
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11376	-0.23418	-2.45295
	setup	CK (R)	0.14681	0.24619	2.52802

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)	0.04725	0.06878	1.78712
	removal	CK (R)	-0.02907	-0.05178	-0.34314
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04707	0.06879	1.69563
	removal	CK (R)	-0.02907	-0.05178	-0.34314

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)	0.04725	0.06878	1.78712
	removal	CK (R)	-0.02907	-0.05178	-0.34314
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04707	0.06879	1.69563
	removal	CK (R)	-0.02907	-0.05178	-0.34314

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 ()	0.10757	0.43945	13.33370
	min_pulse_width	SN ()	0.11089	0.43945	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.10757	0.43945	13.33370
	min_pulse_width	SN ()	0.10426	0.43945	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 ()	0.10094	0.43945	13.33370
	min_pulse_width	CK ()	0.16068	0.43945	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.09762	0.43945	13.33370
	min_pulse_width	CK ()	0.15736	0.43945	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 ()	0.21709	0.43945	13.33370
	min_pulse_width	CK ()	0.12749	0.43945	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.21709	0.43945	13.33370
	min_pulse_width	CK ()	0.12749	0.43945	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	0.01041	0.01253	0.06203
	SN	-0.00102	-0.06845	-1.12739
	SN	0.01603	0.01825	0.07117
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01062	0.01319	0.07191
	SN	-0.00102	-0.05618	-0.81124
	SN	0.01625	0.01896	0.08099

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	0.01731	0.01755	0.04358
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01732	0.01817	0.05650

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	0.01593	0.01617	0.04201
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01593	0.01679	0.05437

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	0.00980	0.01192	0.06093
	SN	-0.00102	-0.06879	-1.13671
	SN	0.01572	0.01793	0.07058
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00960	0.01217	0.07020
	SN	-0.00102	-0.05601	-0.80700
	SN	0.01555	0.01826	0.07979

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	0.00156	0.00155	0.00157
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01258	0.01471	0.08626
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00507	0.00690	0.07202
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00214	0.00213	0.00215
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01316	0.01529	0.08683
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00565	0.00748	0.07260

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	0.00678	0.00672	0.00667
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01975	0.02187	0.09013
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00858	0.01084	0.07687
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00736	0.00730	0.00725
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02033	0.02245	0.09071
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00916	0.01142	0.07745

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)	-0.00346	-0.00351	-0.00350
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00566	0.00745	0.07624
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)	-0.00288	-0.00293	-0.00292
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00623	0.00802	0.07682

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)	0.00569	0.00566	0.00564
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01047	0.01349	0.08517
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)	0.00627	0.00624	0.00622
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01105	0.01407	0.08575

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)	0.00038	0.00338	0.09112
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00348	0.00650	0.09397
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00391	0.00958	0.16610
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00096	0.00396	0.09170
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00406	0.00708	0.09455
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00449	0.01016	0.16668

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)	0.02817	0.03181	0.14390
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01293	0.01713	0.10540
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02717	0.03443	0.17410
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01740	0.02134	0.10909
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01652	0.02407	0.18151
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02875	0.03238	0.14442
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01351	0.01771	0.10598
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02775	0.03497	0.17468
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01798	0.02192	0.10967
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01710	0.02464	0.18209

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00306	0.00878	1.25961
sky130_osu_sc_12T_ms__dff_l	0.00306	0.00878	0.92491

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	121.13100	153.20400
sky130_osu_sc_12T_ms__dff_l	0.00000	187.58900	219.64400

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)**	0.18843	0.69472	6.86120
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.18737	0.74751	6.91361

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)**	0.26909	0.72611	6.18285
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.26916	0.76732	6.15255

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)	-0.05447	-0.05936	0.08400
	setup	CK (R)	0.13492	0.16332	0.48424
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.05267	-0.05587	0.08187
	setup	CK (R)	0.13510	0.16348	0.48942

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)	-0.10239	-0.23372	-2.47395
	setup	CK (R)	0.12326	0.24536	2.53988
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.10019	-0.23382	-2.47206
	setup	CK (R)	0.12326	0.24536	2.53988

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 ()	0.09098	0.43945	13.33370
	min_pulse_width	CK ()	0.14408	0.43945	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.08766	0.43945	13.33370
	min_pulse_width	CK ()	0.14408	0.43945	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 ()**	0.19386	0.43945	13.33370
	min_pulse_width	**CK ()**	0.09762	0.43945	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.19386	0.43945	13.33370
	min_pulse_width	**CK ()**	0.09762	0.43945	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	0.02076	0.02652	0.15407
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02072	0.02652	0.15350

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	0.02258	0.02550	0.11896
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02225	0.02514	0.11839

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	-0.00077	-0.00125	-0.00115
	!CK	0.00000	0.00000	0.00000
	!CK	0.01034	0.01230	0.08267
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00019	-0.00067	-0.00057
	!CK	0.00000	0.00000	0.00000
	!CK	0.01092	0.01288	0.08325

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	0.00384	0.00387	0.00380
	!CK	0.00000	0.00000	0.00000
	!CK	0.01747	0.01976	0.08933
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00442	0.00445	0.00438
	!CK	0.00000	0.00000	0.00000
	!CK	0.01805	0.02034	0.08991

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)	0.00035	0.00336	0.09111
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00057	0.00361	0.09111
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00092	0.00393	0.09169
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00115	0.00419	0.09169

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)	0.01290	0.01709	0.10539
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02588	0.02954	0.14114
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02618	0.03373	0.17618
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01441	0.01843	0.10611
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01348	0.01767	0.10597
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02645	0.03011	0.14171
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02676	0.03430	0.17676
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01498	0.01901	0.10669

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00294	1.21438
sky130_osu_sc_12T_ms__inv_10	0.02641	11.85881
sky130_osu_sc_12T_ms__inv_2	0.00548	2.52348
sky130_osu_sc_12T_ms__inv_3	0.00811	3.70784
sky130_osu_sc_12T_ms__inv_4	0.01069	5.02212
sky130_osu_sc_12T_ms__inv_6	0.01600	7.47707
sky130_osu_sc_12T_ms__inv_8	0.02121	9.93646
sky130_osu_sc_12T_ms__inv_l	0.00229	0.84258

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	17.30370	34.36910
sky130_osu_sc_12T_ms__inv_10	0.00000	172.21600	342.53200
sky130_osu_sc_12T_ms__inv_2	0.00000	34.44470	68.50950
sky130_osu_sc_12T_ms__inv_3	0.00000	51.74750	102.87700
sky130_osu_sc_12T_ms__inv_4	0.00000	68.88850	137.01700
sky130_osu_sc_12T_ms__inv_6	0.00000	103.33200	205.52400
sky130_osu_sc_12T_ms__inv_8	0.00000	137.77500	274.03000
sky130_osu_sc_12T_ms__inv_l	0.00000	50.52320	100.90200

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)**	0.02381	0.62007	9.45871
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.02687	0.37471	9.30605
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01781	0.52336	9.45826
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.01904	0.48341	9.48188
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.01877	0.45167	9.48438
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02074	0.41495	9.48093
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02358	0.39302	9.49647
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02709	0.65952	9.12543

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)**	0.02319	0.57519	8.75019
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.02776	0.36168	8.90186
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01805	0.49866	8.98210
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01929	0.46314	9.06467
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01878	0.43510	9.11068
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02170	0.40161	9.12906
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02461	0.38106	9.14334
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02564	0.59872	8.32335

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	0.00412	0.00557	0.02738
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03433	0.05986	0.26573
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00711	0.01128	0.05249
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01091	0.01717	0.07856
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01391	0.02272	0.10362
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02070	0.03444	0.15528
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02747	0.04716	0.20651
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00319	0.00482	0.03023

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	0.00004	0.00126	0.01590
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.00386	0.01301	0.15448
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00081	0.00183	0.03021
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00074	0.00351	0.04551
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00164	0.00423	0.05989
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00255	0.00702	0.08979
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00332	0.01015	0.11942
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	0.00174	0.00244	0.01409

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ms__mux2_1	0.00941	0.00929	0.00605	0.00487

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	34.75890	34.75890

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)	-	0.01213	0.03578	0.05347
	A1->Y (RR)	-	0.01387	0.03656	0.05367
	S0->Y (RR)	(!A0 * A1)	0.04571	0.14780	0.30027
	S0->Y (FR)	(A0 * !A1)	0.02610	0.10120	0.22780

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)	-	0.01332	0.03926	0.05507
	A1->Y (FF)	-	0.01195	0.03862	0.05510
	S0->Y (FF)	(!A0 * A1)	0.05201	0.15773	0.37430
	S0->Y (RF)	(A0 * !A1)	0.02535	0.10667	0.31667

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	-	-0.00397	-0.00398	-0.00400
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00183	-0.00182	-0.00184
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00515	0.00991	0.09769
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00251	0.00112	0.08815

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	-	0.00399	0.00400	0.00401
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00340	0.00341	0.00341
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00089	0.00490	0.09253
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01110	0.01545	0.10259

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)	-0.00062	-0.00063	-0.00063

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)	0.00122	0.00122	0.00122

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00109	-0.00109	-0.00110

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)	0.00109	0.00109	0.00110

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)	-0.00073	0.00309	0.09025
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00069	0.00313	0.09042

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)	0.00857	0.01307	0.10032
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00771	0.01245	0.10002

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00293	0.00293	0.97771
sky130_osu_sc_12T_ms__nand2_l	0.00224	0.00227	0.73475

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	17.27680	68.49980
sky130_osu_sc_12T_ms__nand2_l	0.00000	50.46800	201.47800

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)	0.02480	0.57691	8.30657
	B->Y (FR)	0.02815	0.55764	7.97213
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.02729	0.62469	8.36368
	B->Y (FR)	0.03255	0.62879	8.36030

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)	0.03576	0.71249	10.12870
	B->Y (RF)	0.04038	0.67683	9.47782
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.03868	0.76539	10.08600
	B->Y (RF)	0.04313	0.72893	9.37603

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	0.00437	0.00586	0.02593
	B	0.00000	0.00000	0.00000
	B	0.00560	0.00704	0.02889
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00323	0.00461	0.02658
	B	0.00000	0.00000	0.00000
	B	0.00410	0.00544	0.02843

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	0.00141	0.00211	0.01574
	B	0.00000	0.00000	0.00000
	B	0.00138	0.00192	0.01540
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00537	0.00573	0.01471
	B	0.00000	0.00000	0.00000
	B	0.00525	0.00553	0.01448

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)	-0.00283	-0.00286	-0.00287
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00199	-0.00201	-0.00201

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)	0.00288	0.00290	0.00288
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00201	0.00204	0.00202

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)	-0.00266	-0.00266	-0.00266
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00189	-0.00190	-0.00189

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)	0.00277	0.00270	0.00267
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00195	0.00191	0.00190

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00289	0.00316	0.69649
sky130_osu_sc_12T_ms__nor2_l	0.00216	0.00237	0.49441

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	15.39620	34.33680
sky130_osu_sc_12T_ms__nor2_l	0.00000	39.58400	100.57000

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)	0.05178	0.70380	8.81868
	B->Y (FR)	0.03957	0.72829	9.41172
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.05445	0.75300	8.55769
	B->Y (FR)	0.04459	0.77193	9.04930

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)	0.03250	0.48728	6.32724
	B->Y (RF)	0.02499	0.47733	6.30589
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.03338	0.50669	6.05477
	B->Y (RF)	0.02711	0.49795	6.03377

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	0.00599	0.00676	0.02882
	B	0.00000	0.00000	0.00000
	B	0.00451	0.00596	0.03119
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00428	0.00513	0.02795
	B	0.00000	0.00000	0.00000
	B	0.00335	0.00484	0.03320

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	0.00114	0.00218	0.02102
	B	0.00000	0.00000	0.00000
	B	0.00005	0.00133	0.01911
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00141	0.00207	0.01814
	B	0.00000	0.00000	0.00000
	B	0.00143	0.00221	0.01695

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)	-0.00179	-0.00232	-0.00220
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00112	-0.00147	-0.00091

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)	0.00282	0.00285	0.00279
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00261	0.00260	0.00243

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)	-0.00098	-0.00101	-0.00097
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00068	-0.00070	-0.00064

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)	0.00129	0.00129	0.00119
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00127	0.00127	0.00103

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00293	0.00304	0.00254	0.66860

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	45.63930	135.15900

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)	0.05641	0.73374	9.17705
	A1->Y (FR)	0.07085	0.71352	8.59170
	B0->Y (FR)	0.03356	0.60778	7.91309

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)	0.04917	0.60112	7.41859
	A1->Y (RF)	0.06112	0.60020	7.28596
	B0->Y (RF)	0.03784	0.63811	8.25692

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	0.00636	0.00749	0.02928
	A1	0.00000	0.00000	0.00000
	A1	0.00788	0.00847	0.02838
	B0	0.00372	0.00549	0.03524

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	0.00323	0.00367	0.01746
	A1	0.00000	0.00000	0.00000
	A1	0.00419	0.00443	0.01902
	B0	0.00271	0.00342	0.01787

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)	-0.00011	-0.00013	-0.00010
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00256	-0.00256	-0.00255
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00256	-0.00258	-0.00256

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)	0.00216	0.00217	0.00207
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00256	0.00256	0.00256
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00265	0.00261	0.00257

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)	-0.00084	-0.00135	-0.00125
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00252	-0.00253	-0.00252
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00252	-0.00253	-0.00253

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)	0.00362	0.00365	0.00359
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00252	0.00253	0.00254
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00262	0.00256	0.00254

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)	-0.00208	-0.00208	-0.00214

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)	0.00214	0.00219	0.00215

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00278	0.00289	0.00306	0.00303	0.71105

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	23.00800	68.44970

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)	0.07477	0.71185	8.67811
	A1->Y (FR)	0.06326	0.73320	9.29868
	B0->Y (FR)	0.04087	0.71490	9.27782
	B1->Y (FR)	0.05358	0.69013	8.65778

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)	0.08364	0.65647	7.81562
	A1->Y (RF)	0.06728	0.63601	7.75608
	B0->Y (RF)	0.05738	0.67443	8.60021
	B1->Y (RF)	0.07441	0.69735	8.67128

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	0.01020	0.01077	0.02954
	A1	0.00869	0.00978	0.03086
	B0	0.00474	0.00609	0.02894
	B1	0.00637	0.00704	0.02669

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00164	0.00198	0.01760
	A1	0.00066	0.00116	0.01597
	B0	0.00065	0.00170	0.01762
	B1	0.00166	0.00227	0.01884

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)	-0.00174	-0.00224	-0.00212
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00158	-0.00207	-0.00195
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00245	-0.00247	-0.00245
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00246	-0.00246	-0.00246

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00280	0.00283	0.00277
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00297	0.00300	0.00293
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00245	0.00249	0.00247
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00256	0.00250	0.00247

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)	-0.00093	-0.00095	-0.00092
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00076	-0.00078	-0.00075
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00245	-0.00246	-0.00245
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00245	-0.00246	-0.00245

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)	0.00129	0.00129	0.00119
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00145	0.00146	0.00136
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00245	0.00247	0.00246
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00256	0.00250	0.00247

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)	-0.00094	-0.00094	-0.00093
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00077	-0.00078	-0.00076
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00284	-0.00285	-0.00284
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00275	-0.00277	-0.00284

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)	0.00130	0.00131	0.00121
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00146	0.00148	0.00137
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00289	0.00291	0.00287
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00284	0.00290	0.00286

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)	-0.00172	-0.00222	-0.00210
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00156	-0.00206	-0.00194
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00289	-0.00290	-0.00289
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00280	-0.00282	-0.00288

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)	0.00279	0.00281	0.00275
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00295	0.00295	0.00292
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00294	0.00297	0.00292
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00289	0.00293	0.00291

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00326	0.00302	1.31367
sky130_osu_sc_12T_ms__or2_2	0.00326	0.00302	2.65686
sky130_osu_sc_12T_ms__or2_4	0.00326	0.00302	5.28150
sky130_osu_sc_12T_ms__or2_8	0.00326	0.00302	10.36209
sky130_osu_sc_12T_ms__or2_l	0.00243	0.00227	0.91180

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	24.17340	34.75480
sky130_osu_sc_12T_ms__or2_2	0.00000	32.81650	68.90160
sky130_osu_sc_12T_ms__or2_4	0.00000	50.23160	137.42200
sky130_osu_sc_12T_ms__or2_8	0.00000	85.06110	274.46000
sky130_osu_sc_12T_ms__or2_l	0.00000	64.92380	101.15900

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)	0.06944	0.57331	6.84933
	B->Y (RR)	0.05847	0.54082	6.67048
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.07441	0.49851	6.77361
	B->Y (RR)	0.06330	0.47077	6.59098
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.09529	0.49041	6.98078
	B->Y (RR)	0.08398	0.46615	6.82017
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.13860	0.53507	7.29264
	B->Y (RR)	0.12692	0.51602	7.14769
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.07162	0.61259	6.63374
	B->Y (RR)	0.06175	0.58640	6.50868

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)	0.10457	0.56957	6.50316
	B->Y (FF)	0.08770	0.57189	6.75424
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.12220	0.53737	6.72475
	B->Y (FF)	0.10553	0.54723	6.97777
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.17270	0.56902	7.05525
	B->Y (FF)	0.15614	0.58663	7.30801
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.27805	0.67318	7.36432
	B->Y (FF)	0.26152	0.69758	7.62797
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.10890	0.60468	6.27860
	B->Y (FF)	0.09332	0.60607	6.50244

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	0.00520	0.00719	0.05552
	B	0.00000	0.00000	0.00000
	B	0.00425	0.00681	0.05819
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00837	0.01053	0.05938
	B	0.00000	0.00000	0.00000
	B	0.00733	0.01022	0.06154
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01604	0.01828	0.06780
	B	0.00000	0.00000	0.00000
	B	0.01484	0.01782	0.08278
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03510	0.03486	0.08807
	B	0.00000	0.00000	0.00000
	B	0.03352	0.03484	0.08675
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00482	0.00674	0.05370
	B	0.00000	0.00000	0.00000
	B	0.00521	0.00769	0.06074

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	0.01076	0.01268	0.07049
	B	0.00000	0.00000	0.00000
	B	0.00895	0.01236	0.08085
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01457	0.01593	0.07314
	B	0.00000	0.00000	0.00000
	B	0.01277	0.01562	0.08297
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02582	0.02399	0.07912
	B	0.00000	0.00000	0.00000
	B	0.02403	0.02372	0.08819
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05862	0.04274	0.09243
	B	0.00000	0.00000	0.00000
	B	0.05688	0.04271	0.10012
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00951	0.01158	0.06463
	B	0.00000	0.00000	0.00000
	B	0.00830	0.01162	0.07567

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)	-0.00179	-0.00232	-0.00222
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00179	-0.00232	-0.00222
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00179	-0.00232	-0.00222
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00178	-0.00231	-0.00221
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00109	-0.00146	-0.00091

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)	0.00285	0.00287	0.00281
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00285	0.00287	0.00281
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00285	0.00288	0.00282
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00286	0.00289	0.00282
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00261	0.00261	0.00244

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)	-0.00098	-0.00101	-0.00098
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00098	-0.00101	-0.00097
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00098	-0.00100	-0.00097
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00097	-0.00100	-0.00096
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00067	-0.00067	-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)	0.00129	0.00130	0.00120
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00129	0.00130	0.00120
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00130	0.00131	0.00120
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00130	0.00132	0.00121
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00127	0.00126	0.00103

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00313	0.00409	0.71668
sky130_osu_sc_12T_ms__tbufi_l	0.00238	0.00310	0.48785

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	17.50060	68.70180
sky130_osu_sc_12T_ms__tbufi_l	0.00000	50.59220	201.40400

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)	0.03684	0.71269	9.30154
	OE->Y (FR)	0.04119	0.33264	5.09325
	OE->Y (RR)	0.07146	0.63537	6.72705
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.04311	0.76305	8.90004
	OE->Y (FR)	0.04134	0.33261	5.09325
	OE->Y (RR)	0.07584	0.69491	6.53100

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)	0.03539	0.62792	8.30312
	OE->Y (FF)	0.04199	0.33264	5.09324
	OE->Y (RF)	0.03199	0.58267	7.50482
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.03876	0.64797	7.76811
	OE->Y (FF)	0.04170	0.33258	5.09324
	OE->Y (RF)	0.03484	0.59768	6.87476

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	0.00519	0.00646	0.02713
	OE	0.00000	0.00000	0.00000
	OE	0.00513	0.00884	0.08750
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00593	0.00713	0.03037
	OE	0.00000	0.00000	0.00000
	OE	0.00556	0.00917	0.08491

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	0.00101	0.00200	0.01663
	OE	0.00000	0.00000	0.00000
	OE	0.00405	0.00804	0.09632
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00477	0.01637
	OE	0.00000	0.00000	0.00000
	OE	0.00600	0.00978	0.09040

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)	-0.00196	-0.00197	-0.00195
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00157	-0.00158	-0.00157
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00145	-0.00146	-0.00142
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00112	-0.00113	-0.00110

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)	0.00196	0.00197	0.00195
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00179	0.00180	0.00173
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00145	0.00146	0.00142
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00153	0.00153	0.00140

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)	0.00223	0.00642	0.09570
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00169	0.00591	0.09528
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00291	0.00686	0.08862
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00183	0.00584	0.08792

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00523	0.00981	0.09942
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00505	0.00968	0.09922
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00397	0.00852	0.09180
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00376	0.00834	0.09128

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00313	0.00470	0.71690
sky130_osu_sc_12T_ms__tnbufi_l	0.00228	0.00351	0.48839

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	28.88010	34.61930
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	84.19930	101.09100

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)	0.03713	0.71284	9.30297
	OE->Y (RR)	0.03028	0.33302	5.09367
	OE->Y (FR)	0.04620	0.68019	8.53211
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.04235	0.76177	8.90260
	OE->Y (RR)	0.03236	0.33271	5.09338
	OE->Y (FR)	0.05013	0.73399	8.16694

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)	0.03470	0.62925	8.30485
	OE->Y (RF)	0.03007	0.33303	5.09364
	OE->Y (FF)	0.05393	0.51184	5.41165
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.03712	0.64689	7.77260
	OE->Y (RF)	0.03212	0.33272	5.09338
	OE->Y (FF)	0.05799	0.53993	5.02726

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	0.00439	0.00559	0.02644
	OE	0.00000	0.00000	0.00000
	OE	0.01063	0.01558	0.10477
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00325	0.00450	0.02789
	OE	0.00000	0.00000	0.00000
	OE	0.00794	0.01274	0.09539

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	0.00002	0.00103	0.01567
	OE	0.00000	0.00000	0.00000
	OE	0.00974	0.01464	0.09778
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00167	0.00239	0.01400
	OE	0.00000	0.00000	0.00000
	OE	0.00870	0.01340	0.09176

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)	-0.00145	-0.00146	-0.00137
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00094	-0.00095	-0.00094
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00032	-0.00033	-0.00027
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00005	0.00005	0.00008

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)	0.00191	0.00192	0.00190
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00176	0.00177	0.00170
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00202	0.00203	0.00199
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00210	0.00210	0.00198

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)	-0.00231	0.00168	0.09152
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00266	0.00157	0.09129
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00082	0.00299	0.08577
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00119	0.00280	0.08511

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)	0.00827	0.01340	0.10351
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00784	0.01309	0.10315
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00694	0.01181	0.09484
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00595	0.01092	0.09411

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xnor2_1	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_1	0.00627	0.00541	0.73562

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_1	0.00000	63.36500	103.07500

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	0.09004	0.66427	6.85112
	A->Y (FR)	!B	0.04933	0.72233	9.34593
	B->Y (RR)	A	0.07342	0.65384	6.99449
	B->Y (FR)	!A	0.06258	0.69994	8.74982

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	0.09574	0.58683	5.81121
	A->Y (RF)	!B	0.04735	0.60803	7.79061
	B->Y (FF)	A	0.08028	0.57509	5.81477
	B->Y (RF)	!A	0.05920	0.62121	7.79296

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	0.00646	0.00992	0.09213
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01071	0.01640	0.12671
	B	A	0.00000	0.00000	0.00000
	B	A	0.00349	0.00768	0.09860
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01157	0.01677	0.12338

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	0.01434	0.01833	0.10707
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00509	0.00946	0.11222
	B	A	0.00000	0.00000	0.00000
	B	A	0.01359	0.01827	0.10859
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00545	0.00981	0.11231

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00631	0.00546	0.70036

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	63.35670	114.42000

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	0.09131	0.67735	7.01301
	A->Y (FR)	B	0.06489	0.71884	8.89283
	B->Y (RR)	!A	0.07714	0.67085	7.02523
	B->Y (FR)	A	0.07097	0.72432	8.87920

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	0.08623	0.56956	5.44782
	A->Y (RF)	B	0.05294	0.64476	8.18186
	B->Y (FF)	!A	0.08281	0.57183	5.62712
	B->Y (RF)	A	0.05804	0.60941	7.51835

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	0.01355	0.01851	0.12175
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00350	0.00659	0.09388
	B	A	0.00000	0.00000	0.00000
	B	A	0.01385	0.01886	0.12101
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00260	0.00648	0.09519

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	0.00495	0.00905	0.10900
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01446	0.01875	0.09983
	B	A	0.00000	0.00000	0.00000
	B	A	0.00493	0.00892	0.10711
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01296	0.01761	0.10556

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp 150.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.55053
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	201633.00000	403266.00000
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
	-0.00120	0.05968	0.90145

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
	3.50984	3.35396	1.05560