sky130_osu_sc_12T_ms_tt_1P89_25C.ccs Library

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

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ms__addf_1	0.01114	0.01120	0.00859	1.41439	0.62917	1.25887
sky130_osu_sc_12T_ms__addf_l	0.01114	0.01120	0.00860	0.95199	0.62813	1.24563

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.08167	0.10380
sky130_osu_sc_12T_ms__addf_l	0.00000	0.36328	0.66718

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)	0.12891	1.52768	23.56540
	B->CO (RR)	0.12545	1.49780	23.11410
	CI->CO (RR)	0.12106	1.56018	24.23970
	CON->CO (FR)	0.02186	0.66834	10.85760
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.12774	1.39544	18.65690
	B->CO (RR)	0.12459	1.37929	18.59040
	CI->CO (RR)	0.11992	1.42869	19.36550
	CON->CO (FR)	0.02563	0.71019	10.43360

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)	0.18747	2.00212	30.57330
	B->CO (FF)	0.16628	1.91002	29.28730
	CI->CO (FF)	0.16510	2.00174	30.99290
	CON->CO (RF)	0.01896	0.53051	8.59725
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.18380	1.77839	23.46660
	B->CO (FF)	0.16337	1.70318	22.61070
	CI->CO (FF)	0.16150	1.77917	23.92020
	CON->CO (RF)	0.02133	0.55536	8.19418

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)	0.14784	0.89132	10.10020
	B->CON (FR)	0.12602	0.83240	9.86470
	CI->CON (FR)	0.12550	0.89295	10.58890
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.14028	0.88339	10.08050
	B->CON (FR)	0.11935	0.82535	9.84858
	CI->CON (FR)	0.11793	0.88514	10.57120

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)	0.08327	0.54053	6.25474
	B->CON (RF)	0.08092	0.55747	6.66100
	CI->CON (RF)	0.07542	0.57562	7.00459
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.08055	0.53752	6.24536
	B->CON (RF)	0.07833	0.55467	6.65136
	CI->CON (RF)	0.07268	0.57260	6.99443

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)	0.27324	1.80994	23.64090
	B->S (-R)	0.28026	1.79077	22.84720
	CI->S (-R)	0.24917	1.80717	24.07110
	CON->S (RR)	0.07250	0.59952	6.98635
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.26322	1.79391	23.42450
	B->S (-R)	0.27029	1.77561	22.64430
	CI->S (-R)	0.23917	1.79117	23.85200
	CON->S (RR)	0.07253	0.59676	6.91427

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)	0.21907	1.33284	16.28930
	B->S (-F)	0.21376	1.28742	16.04860
	CI->S (-F)	0.21079	1.36291	16.97630
	CON->S (FF)	0.09134	0.59261	6.24103
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.21373	1.32314	16.14410
	B->S (-F)	0.20870	1.27879	15.91630
	CI->S (-F)	0.20539	1.35307	16.83430
	CON->S (FF)	0.09138	0.59070	6.19160

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	0.00274	0.00343	0.01871
	B	0.00398	0.00446	0.01784
	CI	0.00400	0.00482	0.02010
sky130_osu_sc_12T_ms__addf_l	A	0.00242	0.00295	0.01442
	B	0.00367	0.00401	0.01428
	CI	0.00370	0.00438	0.01590

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00993	0.01125	0.04088
	B	0.01037	0.01147	0.03773
	CI	0.00842	0.00982	0.04001
sky130_osu_sc_12T_ms__addf_l	A	0.00968	0.01056	0.02973
	B	0.01011	0.01084	0.02760
	CI	0.00816	0.00914	0.02911

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00991	0.01062	0.02468
	B	0.01035	0.01094	0.02313
	CI	0.00841	0.00921	0.02392
sky130_osu_sc_12T_ms__addf_l	A	0.00965	0.01029	0.02359
	B	0.01000	0.01048	0.02226
	CI	0.00816	0.00889	0.02301

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00323	0.00336	0.01035
	B	0.00394	0.00417	0.01227
	CI	0.00399	0.00451	0.01325
sky130_osu_sc_12T_ms__addf_l	A	0.00292	0.00305	0.01040
	B	0.00364	0.00387	0.01227
	CI	0.00368	0.00421	0.01326

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00993	0.01112	0.03754
	B	0.01037	0.01135	0.03458
	CI	0.00842	0.00972	0.03659
sky130_osu_sc_12T_ms__addf_l	A	0.00967	0.01075	0.03567
	B	0.01011	0.01100	0.03286
	CI	0.00816	0.00936	0.03483

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.02160	0.02176	0.04362
	B	0.01969	0.01981	0.04573
	CI	0.01780	0.01764	0.03799
sky130_osu_sc_12T_ms__addf_l	A	0.02160	0.02176	0.04359
	B	0.01965	0.01983	0.04578
	CI	0.01778	0.01765	0.03802

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00547	0.00576	1.36482	1.40020	1.42124
sky130_osu_sc_12T_ms__addh_l	0.00546	0.00576	0.94834	1.40202	0.96855

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.09723	0.10351
sky130_osu_sc_12T_ms__addh_l	0.00000	0.66030	0.66656

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)	0.08661	0.59910	6.84149
	B->CO (RR)	0.08943	0.59192	6.90843
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.08520	0.64155	6.72649
	B->CO (RR)	0.08804	0.63615	6.75894

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)	0.07499	0.56960	6.53610
	B->CO (FF)	0.07950	0.58408	6.59933
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.07448	0.59530	6.31750
	B->CO (FF)	0.07892	0.61120	6.39192

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)	0.12228	0.61654	6.80139
	B->CON (RR)	0.12469	0.60826	6.87279
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.11341	0.60265	6.79518
	B->CON (RR)	0.11589	0.59545	6.84562

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)	0.10310	0.59097	6.64381
	B->CON (FF)	0.10133	0.59983	6.68971
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.09564	0.57255	6.52443
	B->CON (FF)	0.09411	0.58157	6.57046

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)	0.14152	1.25087	17.20230
	B->S (FR)	0.13970	1.26109	17.29790
	CON->S (FR)	0.02342	0.67916	11.05560
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.13535	1.16608	13.90630
	B->S (FR)	0.13364	1.17601	13.98470
	CON->S (FR)	0.02633	0.71598	10.58970

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)	0.15434	1.20486	16.23480
	B->S (RF)	0.15679	1.19567	16.29890
	CON->S (RF)	0.01858	0.53079	8.65708
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.14772	1.09677	12.60690
	B->S (RF)	0.15017	1.09063	12.65020
	CON->S (RF)	0.02085	0.55895	8.31479

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	0.00503	0.00514	0.01502
	B	0.00000	0.00000	0.00000
	B	0.00458	0.00458	0.01661
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00444	0.00450	0.01502
	B	0.00000	0.00000	0.00000
	B	0.00400	0.00393	0.01594

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	0.00706	0.00725	0.02014
	B	0.00000	0.00000	0.00000
	B	0.00743	0.00795	0.02114
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00647	0.00666	0.01971
	B	0.00000	0.00000	0.00000
	B	0.00683	0.00732	0.02077

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	0.00503	0.00514	0.01500
	B	0.00000	0.00000	0.00000
	B	0.00458	0.00458	0.01664
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00444	0.00450	0.01497
	B	0.00000	0.00000	0.00000
	B	0.00399	0.00393	0.01604

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	0.00706	0.00725	0.01987
	B	0.00000	0.00000	0.00000
	B	0.00743	0.00796	0.02120
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00646	0.00666	0.01996
	B	0.00000	0.00000	0.00000
	B	0.00683	0.00733	0.02092

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	0.00707	0.00725	0.02016
	B	0.00000	0.00000	0.00000
	B	0.00743	0.00796	0.02145
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00647	0.00667	0.01972
	B	0.00000	0.00000	0.00000
	B	0.00684	0.00732	0.02080

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	0.00503	0.00514	0.01586
	B	0.00000	0.00000	0.00000
	B	0.00458	0.00458	0.01673
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00444	0.00451	0.01534
	B	0.00000	0.00000	0.00000
	B	0.00399	0.00395	0.01626

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)	1.74144	1.66980	0.54991
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.74155	1.66990	0.55003

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)	1.74135	1.67048	0.58181
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.74146	1.67060	0.58193

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00293	0.00303	1.37512
sky130_osu_sc_12T_ms__and2_2	0.00293	0.00304	2.68702
sky130_osu_sc_12T_ms__and2_4	0.00293	0.00304	5.25594
sky130_osu_sc_12T_ms__and2_6	0.00296	0.00303	7.70156
sky130_osu_sc_12T_ms__and2_8	0.00293	0.00304	10.08454
sky130_osu_sc_12T_ms__and2_l	0.00222	0.00229	0.95204

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.04305	0.06877
sky130_osu_sc_12T_ms__and2_2	0.00000	0.06878	0.06918
sky130_osu_sc_12T_ms__and2_4	0.00000	0.12026	0.13713
sky130_osu_sc_12T_ms__and2_6	0.00000	0.17174	0.20550
sky130_osu_sc_12T_ms__and2_8	0.00000	0.22321	0.27386
sky130_osu_sc_12T_ms__and2_l	0.00000	0.74719	1.19542

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)	0.06590	0.54450	6.79314
	B->Y (RR)	0.07027	0.54270	6.63738
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.07439	0.48464	6.74091
	B->Y (RR)	0.07873	0.47846	6.59242
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.10176	0.49219	7.00730
	B->Y (RR)	0.10612	0.47857	6.86609
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.12965	0.52164	7.12404
	B->Y (RR)	0.13390	0.50244	6.98414
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.15683	0.55482	7.28650
	B->Y (RR)	0.16118	0.53334	7.14971
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.06994	0.60270	6.89046
	B->Y (RR)	0.07426	0.59719	6.68497

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)	0.05998	0.50834	6.01611
	B->Y (FF)	0.06154	0.51739	6.07187
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.06846	0.47701	6.06492
	B->Y (FF)	0.06977	0.48355	6.11606
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.09534	0.50143	6.34298
	B->Y (FF)	0.09462	0.50133	6.38926
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.12423	0.53695	6.48508
	B->Y (FF)	0.12129	0.53414	6.51631
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.15143	0.57116	6.59366
	B->Y (FF)	0.14661	0.56459	6.62073
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.06060	0.52266	5.70801
	B->Y (FF)	0.06526	0.53769	5.77168

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	0.00335	0.00400	0.04507
	B	0.00000	0.00000	0.00000
	B	0.00340	0.00350	0.02905
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00647	0.00720	0.04449
	B	0.00000	0.00000	0.00000
	B	0.00653	0.00682	0.03202
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01379	0.01475	0.04995
	B	0.00000	0.00000	0.00000
	B	0.01388	0.01436	0.03842
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02183	0.02230	0.05655
	B	0.00000	0.00000	0.00000
	B	0.02195	0.02195	0.04514
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03048	0.03016	0.06487
	B	0.00000	0.00000	0.00000
	B	0.03051	0.02962	0.05257
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00260	0.00358	0.04633
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00309	0.03604

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	0.00877	0.01030	0.04365
	B	0.00000	0.00000	0.00000
	B	0.00994	0.01149	0.04312
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01112	0.01302	0.04624
	B	0.00000	0.00000	0.00000
	B	0.01232	0.01400	0.04586
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01735	0.01948	0.05257
	B	0.00000	0.00000	0.00000
	B	0.01847	0.02032	0.05212
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02439	0.02670	0.05913
	B	0.00000	0.00000	0.00000
	B	0.02540	0.02667	0.05886
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03260	0.03350	0.06591
	B	0.00000	0.00000	0.00000
	B	0.03303	0.03375	0.06467
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00663	0.00858	0.04799
	B	0.00000	0.00000	0.00000
	B	0.00747	0.00922	0.04745

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)	-0.00306	-0.00307	-0.00309
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00306	-0.00307	-0.00309
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00305	-0.00307	-0.00309
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00308	-0.00310	-0.00312
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00306	-0.00307	-0.00308
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00215	-0.00215	-0.00216

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)	0.00308	0.00312	0.00310
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00308	0.00312	0.00310
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00308	0.00312	0.00310
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00312	0.00315	0.00313
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00309	0.00312	0.00310
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00217	0.00219	0.00218

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)	-0.00291	-0.00292	-0.00292
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00292	-0.00292	-0.00292
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00292	-0.00293	-0.00292
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00291	-0.00293	-0.00292
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00291	-0.00292	-0.00292
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00205	-0.00205	-0.00205

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)	0.00296	0.00296	0.00293
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00296	0.00295	0.00293
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00297	0.00295	0.00293
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00297	0.00296	0.00293
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00297	0.00294	0.00293
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00209	0.00208	0.00207

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__aoi21_l	0.00268	0.00287	0.00281	0.58490

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.01716	0.03418

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)	0.07621	0.82357	9.83318
	A1->Y (FR)	0.05995	0.75026	9.22962
	B0->Y (FR)	0.05785	0.83605	10.46080

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)	0.04235	0.47908	5.83296
	A1->Y (RF)	0.03893	0.50375	6.33152
	B0->Y (RF)	0.02606	0.47523	6.14366

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	0.00754	0.00749	0.01290
	A1	0.00000	0.00000	0.00000
	A1	0.00633	0.00623	0.01168
	B0	0.00462	0.00493	0.01382

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	0.00152	0.00135	0.00565
	A1	0.00000	0.00000	0.00000
	A1	0.00157	0.00153	0.00670
	B0	-0.00066	-0.00026	0.00466

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)	-0.00213	-0.00253	-0.00252
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00255	-0.00256	-0.00255
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00255	-0.00257	-0.00255

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)	0.00251	0.00253	0.00252
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00255	0.00258	0.00256
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00260	0.00258	0.00256

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)	-0.00212	-0.00253	-0.00252
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00255	-0.00257	-0.00256
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00281	-0.00282	-0.00283

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)	0.00250	0.00254	0.00252
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00255	0.00259	0.00257
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00282	0.00288	0.00284

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)	-0.00116	-0.00116	-0.00116

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)	0.00126	0.00126	0.00118

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_l	0.00268	0.00286	0.00299	0.00280	0.57163

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.01954	0.06836

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)	0.09776	0.84462	9.75664
	A1->Y (FR)	0.08671	0.82840	9.69869
	B0->Y (FR)	0.06105	0.83068	10.32690
	B1->Y (FR)	0.07253	0.84923	10.40150

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)	0.05544	0.49030	5.76729
	A1->Y (RF)	0.05197	0.51253	6.26178
	B0->Y (RF)	0.02865	0.48636	6.23003
	B1->Y (RF)	0.03284	0.46136	5.73829

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	0.00915	0.00905	0.01471
	A1	0.00794	0.00781	0.01333
	B0	0.00503	0.00556	0.01482
	B1	0.00629	0.00628	0.01590

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00311	0.00293	0.00740
	A1	0.00316	0.00323	0.00846
	B0	-0.00045	-0.00018	0.00508
	B1	-0.00038	-0.00037	0.00405

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)	-0.00216	-0.00252	-0.00252
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00255	-0.00257	-0.00255
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00255	-0.00257	-0.00255
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00255	-0.00257	-0.00255

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)	0.00250	0.00252	0.00252
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00255	0.00258	0.00256
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00260	0.00258	0.00256
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00260	0.00258	0.00256

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)	-0.00215	-0.00253	-0.00252
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00255	-0.00257	-0.00256
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00280	-0.00281	-0.00282
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00280	-0.00281	-0.00282

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)	0.00251	0.00253	0.00252
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00255	0.00259	0.00257
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00281	0.00287	0.00283
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00281	0.00287	0.00283

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)	-0.00115	-0.00116	-0.00115
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00114	-0.00116	-0.00115
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00293	-0.00294	-0.00295
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00292	-0.00294	-0.00295

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)	0.00130	0.00130	0.00119
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00114	0.00116	0.00115
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00294	0.00296	0.00295
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00294	0.00296	0.00295

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)	-0.00117	-0.00118	-0.00117
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00116	-0.00117	-0.00116
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00269	-0.00270	-0.00269
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00269	-0.00270	-0.00269

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)	0.00131	0.00132	0.00120
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00116	0.00117	0.00116
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00274	0.00271	0.00270
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00274	0.00272	0.00270

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00304	1.26943
sky130_osu_sc_12T_ms__buf_2	0.00304	2.61033
sky130_osu_sc_12T_ms__buf_4	0.00304	5.20774
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00305	10.23906
sky130_osu_sc_12T_ms__buf_l	0.00226	0.95774

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.03459	0.03459
sky130_osu_sc_12T_ms__buf_2	0.00000	0.05189	0.06877
sky130_osu_sc_12T_ms__buf_4	0.00000	0.08648	0.13714
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.15566	0.27386
sky130_osu_sc_12T_ms__buf_l	0.00000	0.59781	0.59781

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)	0.05169	0.52430	6.44170
sky130_osu_sc_12T_ms__buf_2	A->Y (RR)	0.05523	0.44883	6.44218
sky130_osu_sc_12T_ms__buf_4	A->Y (RR)	0.07398	0.43995	6.70708
sky130_osu_sc_12T_ms__buf_8	A->Y (RR)	0.11110	0.48136	7.04073
sky130_osu_sc_12T_ms__buf_l	A->Y (RR)	0.05421	0.56944	6.59705

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)	0.05603	0.48524	5.65934
sky130_osu_sc_12T_ms__buf_2	A->Y (FF)	0.06479	0.46663	5.98086
sky130_osu_sc_12T_ms__buf_4	A->Y (FF)	0.09145	0.49390	6.34255
sky130_osu_sc_12T_ms__buf_8	A->Y (FF)	0.14669	0.56745	6.69522
sky130_osu_sc_12T_ms__buf_l	A->Y (FF)	0.05861	0.52093	5.80547

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	0.00320	0.00379	0.02879
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00624	0.00692	0.03244
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01332	0.01443	0.03939
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02852	0.02983	0.05519
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00249	0.00348	0.04087

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	0.00843	0.00991	0.04188
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01076	0.01229	0.04442
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01695	0.01880	0.05028
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03188	0.03134	0.06285
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00651	0.00848	0.04946

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
	-0.00075	-0.00075	-0.00071

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
	0.00075	0.00075	0.00071

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	**RN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ms__dffnr_1	0.00280	0.00279	0.00895	1.36358	1.35496
sky130_osu_sc_12T_ms__dffnr_l	0.00280	0.00279	0.00895	0.96290	0.95636

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.41203	0.89378
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.97525	1.45700

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)	0.32251	1.39768	16.08670
	QN->Q (FR)	0.02556	0.74758	12.04220
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.31861	1.48520	15.62770
	QN->Q (FR)	0.02777	0.76722	11.29710

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)	0.21006	1.28843	16.71040
	QN->Q (RF)	0.02065	0.57457	9.24844
	RN->Q (FF)	0.19970	1.30202	16.76340
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.21248	1.41282	16.54430
	QN->Q (RF)	0.02246	0.59567	8.83792
	RN->Q (FF)	0.20221	1.42615	16.59800

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)	0.18160	0.73403	7.89000
	RN->QN (FR)	0.17119	0.74755	7.94327
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.17994	0.78703	7.86007
	RN->QN (FR)	0.16961	0.80045	7.91159

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)**	0.28484	0.77845	6.26203
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.27869	0.80257	6.16186

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)	-0.09093	-0.18737	-0.53461
	setup	CK (F)	0.15041	0.19836	0.57628
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.09436	-0.18743	-0.53485
	setup	CK (F)	0.15066	0.19836	0.57629

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)	-0.06603	-0.08167	-0.18811
	setup	CK (F)	0.15787	0.19259	0.39364
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06841	-0.08120	-0.18599
	setup	CK (F)	0.15750	0.19217	0.39628

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)	-0.09093	-0.18737	-0.53461
	setup	CK (F)	0.15041	0.19836	0.57628
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.09436	-0.18743	-0.53485
	setup	CK (F)	0.15066	0.19836	0.57629

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)	-0.06603	-0.08167	-0.18811
	setup	CK (F)	0.15787	0.19259	0.39364
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.06841	-0.08120	-0.18599
	setup	CK (F)	0.15750	0.19217	0.39628

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)	0.12434	0.10557	-1.00660
	removal	CK (F)	-0.08772	-0.09037	1.02170
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.12484	0.10568	-1.00735
	removal	CK (F)	-0.08772	-0.09037	1.02170

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)	0.12434	0.10557	-1.00660
	removal	CK (F)	-0.08772	-0.09037	1.02170
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.12484	0.10568	-1.00735
	removal	CK (F)	-0.08772	-0.09037	1.02170

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 ()	0.12501	0.41016	13.33370
	min_pulse_width	RN ()	0.12191	0.41016	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.11881	0.41016	13.33370
	min_pulse_width	RN ()	0.11881	0.41016	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 ()	0.14360	0.41016	13.33370
	min_pulse_width	CK ()	0.19320	0.41016	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.14670	0.41016	13.33370
	min_pulse_width	CK ()	0.19320	0.41016	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 ()	0.14050	0.41016	13.33370
	min_pulse_width	CK ()	0.10641	0.41016	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.13740	0.41016	13.33370
	min_pulse_width	CK ()	0.10331	0.41016	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	0.01653	0.01560	0.01188
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01564	0.01533	0.02472

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	0.01639	0.01601	0.02652
	RN	-0.00111	-0.07392	-1.21771
	RN	0.02172	0.02071	0.01856
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01550	0.01574	0.03891
	RN	-0.00111	-0.06000	-0.85989
	RN	0.02082	0.02043	0.03112

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	0.01638	0.01600	0.02664
	RN	-0.00111	-0.07364	-1.21000
	RN	0.02172	0.02070	0.01855
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01550	0.01574	0.03883
	RN	-0.00111	-0.05975	-0.85405
	RN	0.02082	0.02044	0.03077

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	0.01649	0.01559	0.01205
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01560	0.01530	0.02484

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)	0.01067	0.01056	0.03715
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00345	0.00344	0.02977
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00237	-0.00279	-0.00281
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)	0.01067	0.01056	0.03715
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00345	0.00345	0.02978
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00236	-0.00279	-0.00281

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)	0.01689	0.01699	0.04418
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00916	0.00931	0.03579
	!CK	0.00000	0.00000	0.00000
	!CK	0.00280	0.00282	0.00282
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)	0.01689	0.01699	0.04418
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00916	0.00932	0.03580
	!CK	0.00000	0.00000	0.00000
	!CK	0.00281	0.00283	0.00283

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)	0.01071	0.01109	0.05418
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00332	0.00385	0.04511
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01072	0.01109	0.05428
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00332	0.00385	0.04512

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)	0.01672	0.01775	0.06026
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00875	0.00995	0.05146
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01672	0.01776	0.06026
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00876	0.00995	0.05146

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)	-0.00049	-0.00030	0.04126
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01145	0.01208	0.07329
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00301	0.00397	0.08011
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01404	0.01393	0.07101
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00041	-0.00011	0.04123
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00049	-0.00030	0.04127
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01146	0.01209	0.07330
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00301	0.00397	0.08011
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01405	0.01393	0.07102
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00041	-0.00010	0.04124

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	0.01464	0.05666
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01759	0.01966	0.09637
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01453	0.01546	0.05709
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01345	0.01465	0.05667
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01760	0.01966	0.09638
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01454	0.01547	0.05709

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00280	0.00279	0.00874	1.35452	1.35426
sky130_osu_sc_12T_ms__dffr_l	0.00280	0.00279	0.00873	0.95287	0.95900

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.41203	0.89412
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.97525	1.45734

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)	0.26013	1.23167	14.56360
	QN->Q (FR)	0.02556	0.74525	11.99220
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.25604	1.31624	14.04570
	QN->Q (FR)	0.02777	0.76399	11.22360

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)	0.26826	1.27414	15.36280
	QN->Q (RF)	0.02065	0.57329	9.21282
	RN->Q (FF)	0.19994	1.29869	16.66290
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.27057	1.39596	15.15040
	QN->Q (RF)	0.02246	0.59370	8.78445
	RN->Q (FF)	0.20246	1.42004	16.44040

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)	0.23982	0.72331	6.64362
	RN->QN (FR)	0.17139	0.74802	7.94123
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.23802	0.77785	6.64319
	RN->QN (FR)	0.16980	0.80181	7.93114

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)**	0.22238	0.61575	4.83279
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.21607	0.64052	4.74385

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)	-0.05361	-0.06436	0.03969
	setup	CK (R)	0.20199	0.22667	1.71151
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.05158	-0.06639	0.03574
	setup	CK (R)	0.20217	0.22733	1.35640

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)	-0.10630	-0.27940	-0.93006
	setup	CK (R)	0.12884	0.29040	3.27216
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.10913	-0.27940	-1.08862
	setup	CK (R)	0.12884	0.29040	3.27216

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)	-0.05361	-0.06436	0.03969
	setup	CK (R)	0.20199	0.22667	1.71151
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.05158	-0.06639	0.03574
	setup	CK (R)	0.20217	0.22733	1.35640

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)	-0.10630	-0.27940	-0.93006
	setup	CK (R)	0.12884	0.29040	3.27216
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.10913	-0.27940	-1.08862
	setup	CK (R)	0.12884	0.29040	3.27216

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)	0.17419	0.20250	1.36240
	removal	CK (R)	-0.03534	-0.04166	-0.06679
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.17465	0.20291	1.29983
	removal	CK (R)	-0.03534	-0.04166	-0.06679

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)	0.17419	0.20250	1.36240
	removal	CK (R)	-0.03534	-0.04166	-0.06679
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.17465	0.20291	1.29983
	removal	CK (R)	-0.03534	-0.04166	-0.06679

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 ()	0.12191	0.41016	13.33370
	min_pulse_width	RN ()	0.12501	0.41016	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.11881	0.41016	13.33370
	min_pulse_width	RN ()	0.11881	0.41016	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 ()	0.11881	0.41016	13.33370
	min_pulse_width	CK ()	0.14050	0.41016	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.11261	0.41016	13.33370
	min_pulse_width	CK ()	0.13740	0.41016	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 ()	0.25828	0.41016	13.33370
	min_pulse_width	CK ()	0.10951	0.41016	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.25828	0.41016	13.33370
	min_pulse_width	CK ()	0.10951	0.41016	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	0.00867	0.00769	0.01344
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00778	0.00741	0.02617

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	0.00988	0.00847	0.00567
	RN	-0.00111	-0.07363	-1.20962
	RN	0.02264	0.02161	0.01968
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00899	0.00821	0.01798
	RN	-0.00111	-0.05962	-0.85093
	RN	0.02174	0.02135	0.03160

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	0.00988	0.00847	0.00559
	RN	-0.00111	-0.07362	-1.20938
	RN	0.02263	0.02161	0.01947
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00899	0.00820	0.01785
	RN	-0.00111	-0.05985	-0.85641
	RN	0.02174	0.02135	0.03162

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	0.00864	0.00766	0.01352
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00775	0.00737	0.02610

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	-0.00209	-0.00252	-0.00255
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01095	0.01082	0.03740
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00434	0.00431	0.03064
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00208	-0.00252	-0.00255
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01096	0.01083	0.03741
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00434	0.00433	0.03065

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	0.00253	0.00255	0.00255
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01663	0.01675	0.04393
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00827	0.00845	0.03493
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00254	0.00256	0.00256
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01663	0.01676	0.04393
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00828	0.00845	0.03494

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)	0.00332	0.00385	0.04511
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01016	0.01053	0.05372
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)	0.00332	0.00385	0.04512
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01016	0.01054	0.05373

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)	0.00874	0.00994	0.05146
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01727	0.01830	0.06081
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)	0.00875	0.00995	0.05146
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01728	0.01831	0.06081

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)	-0.00073	-0.00047	0.04122
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00560	0.00529	0.04852
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00075	-0.00043	0.04111
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00046	0.04123
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00561	0.00530	0.04852
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00075	-0.00042	0.04112

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)	0.01318	0.01444	0.05659
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02726	0.02786	0.07813
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02039	0.02121	0.06403
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02652	0.02873	0.09842
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01440	0.01551	0.05713
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01318	0.01444	0.05661
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02726	0.02784	0.07813
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02039	0.02121	0.06404
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02652	0.02874	0.09842
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01440	0.01552	0.05714

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ms__dffsr_1	0.00277	0.00281	0.00653	0.00884	1.42177	1.42454
sky130_osu_sc_12T_ms__dffsr_l	0.00277	0.00281	0.00653	0.00884	0.96355	0.95718

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.12571	0.17261
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.68892	0.73582

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)	0.27921	1.27067	15.07110
	QN->Q (FR)	0.02396	0.72000	11.72990
	RN->Q (RR)	0.22459	1.22639	15.12460
	SN->Q (FR)	0.20735	1.29109	16.53530
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.27931	1.35738	14.26950
	QN->Q (FR)	0.02770	0.76723	11.29730
	RN->Q (RR)	0.22617	1.31699	14.33060
	SN->Q (FR)	0.20764	1.37587	15.72470

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)	0.30788	1.32669	15.82640
	QN->Q (RF)	0.02048	0.58238	9.47102
	RN->Q (FF)	0.21017	1.32418	17.12150
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.31171	1.44937	15.36790
	QN->Q (RF)	0.02233	0.59520	8.83344
	RN->Q (FF)	0.21426	1.44638	16.64950

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)	0.27895	0.76567	6.77143
	RN->QN (FR)	0.18165	0.76310	8.06066
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.27867	0.82365	6.68598
	RN->QN (FR)	0.18156	0.82085	7.96520

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)	0.24305	0.65476	5.14400
	RN->QN (RF)	0.19003	0.61434	5.20618
	SN->QN (FF)	0.17171	0.67574	6.60776
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.23993	0.67410	4.79866
	RN->QN (RF)	0.18706	0.63446	4.85771
	SN->QN (FF)	0.16870	0.69325	6.25314

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)	-0.06078	-0.07500	-0.03145
	setup	CK (R)	0.21176	0.23410	1.61899
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.05983	-0.07600	-0.03170
	setup	CK (R)	0.21161	0.23406	1.63925

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)	-0.12215	-0.29917	0.03050
	setup	CK (R)	0.15012	0.30868	3.31956
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12246	-0.30098	0.01876
	setup	CK (R)	0.15000	0.30868	3.31956

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)	-0.06078	-0.07500	-0.03145
	setup	CK (R)	0.21176	0.23410	1.61899
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.05983	-0.07600	-0.03170
	setup	CK (R)	0.21161	0.23406	1.63925

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)	-0.12215	-0.29917	0.03050
	setup	CK (R)	0.15012	0.30868	3.31956
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12246	-0.30098	0.01876
	setup	CK (R)	0.15000	0.30868	3.31956

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)	0.16708	0.19182	1.31147
	removal	CK (R)	-0.02704	-0.03260	-0.06451
	hold	SN (R)	-0.16518	-0.29045	-1.22611
	setup	SN (R)	0.19059	0.32770	6.83693
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.16711	0.19170	1.31707
	removal	CK (R)	-0.02704	-0.03260	-0.06451
	hold	SN (R)	-0.15860	-0.28264	-1.19399
	setup	SN (R)	0.18737	0.32000	6.92411

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)	0.16708	0.19182	1.31147
	removal	CK (R)	-0.02704	-0.03260	-0.06451
	hold	SN (R)	-0.16518	-0.29045	-1.22611
	hold	SN (R)	-0.16656	-0.29250	-1.23084
	setup	SN (R)	0.18890	0.32410	6.83693
	setup	SN (R)	0.19059	0.32770	6.83330
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.16711	0.19170	1.31707
	removal	CK (R)	-0.02704	-0.03260	-0.06451
	hold	SN (R)	-0.16121	-0.28264	-1.19399
	hold	SN (R)	-0.15860	-0.28464	-1.19873
	setup	SN (R)	0.18737	0.31803	6.92411
	setup	SN (R)	0.17952	0.32000	6.83386

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 ()	0.14050	0.41016	13.33370
	min_pulse_width	RN ()	0.14360	0.41016	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.14050	0.41016	13.33370
	min_pulse_width	RN ()	0.14050	0.41016	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)	0.03554	0.06660	6.38039
	removal	CK (R)	-0.01713	-0.05307	-0.28992
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.03840	0.06652	6.13490
	removal	CK (R)	-0.01713	-0.05307	-0.28992

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)	0.03554	0.06660	6.38039
	removal	CK (R)	-0.01713	-0.05307	-0.28992
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.03840	0.06652	6.13490
	removal	CK (R)	-0.01713	-0.05307	-0.28992

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 ()	0.16530	0.41016	13.33370
	min_pulse_width	SN ()	0.17150	0.41016	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.16530	0.41016	13.33370
	min_pulse_width	SN ()	0.16220	0.41016	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 ()	0.12501	0.41016	13.33370
	min_pulse_width	CK ()	0.15910	0.41016	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.12191	0.41016	13.33370
	min_pulse_width	CK ()	0.15600	0.41016	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 ()	0.27068	0.41016	13.33370
	min_pulse_width	CK ()	0.13121	0.41016	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.27068	0.41016	13.33370
	min_pulse_width	CK ()	0.13121	0.41016	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	0.01085	0.00965	0.01402
	RN	0.01977	0.01845	0.01399
	SN	-0.00111	-0.07580	-1.26967
	SN	0.02217	0.02031	0.01401
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01002	0.00946	0.02800
	RN	0.01892	0.01825	0.02785
	SN	-0.00111	-0.06002	-0.86048
	SN	0.02134	0.02013	0.02816

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	0.01150	0.01056	0.01390
	RN	-0.00111	-0.07580	-1.26967
	RN	0.02388	0.02325	0.02740
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01063	0.00988	0.01972
	RN	-0.00111	-0.06002	-0.86048
	RN	0.02299	0.02256	0.03324

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	0.01149	0.01056	0.01515
	RN	-0.00111	-0.07589	-1.27213
	RN	0.02387	0.02321	0.02703
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01062	0.00988	0.01957
	RN	-0.00111	-0.05978	-0.85478
	RN	0.02298	0.02253	0.03301

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	0.01081	0.00963	0.01360
	RN	0.01973	0.01842	0.01373
	SN	-0.00111	-0.07589	-1.27209
	SN	0.02214	0.02030	0.01426
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00943	0.02778
	RN	0.01888	0.01822	0.02795
	SN	-0.00111	-0.05978	-0.85476
	SN	0.02130	0.02011	0.02839

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	-0.00252	-0.00256	-0.00256
	(!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)	0.01383	0.01372	0.03984
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00475	0.00473	0.03081
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00473	0.00470	0.03079
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00477	0.00475	0.03084
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00252	-0.00256	-0.00257
	(!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)	0.01384	0.01372	0.03985
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00475	0.00473	0.03081
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00473	0.00471	0.03080
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00477	0.00476	0.03084

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	0.00260	0.00258	0.00256
	(!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)	0.01919	0.01921	0.04579
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00898	0.00917	0.03550
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00906	0.00922	0.03549
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00895	0.00914	0.03547
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00260	0.00258	0.00257
	(!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)	0.01919	0.01921	0.04579
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00899	0.00918	0.03550
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00907	0.00922	0.03549
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00896	0.00915	0.03547

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)	0.00256	0.00303	0.04414
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01198	0.01219	0.05424
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)	0.00257	0.00304	0.04414
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01199	0.01220	0.05424

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)	0.00946	0.01077	0.05244
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01826	0.01924	0.06152
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)	0.00947	0.01077	0.05244
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01826	0.01925	0.06152

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)	-0.00649	-0.00651	-0.00652
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00621	-0.00706	-0.00703
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00613	-0.00654	-0.00653
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00315	0.00322	0.03039
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)	-0.00648	-0.00651	-0.00652
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00620	-0.00705	-0.00702
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00613	-0.00653	-0.00653
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00316	0.00324	0.03040

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)	0.00651	0.00666	0.00654
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00699	0.00709	0.00703
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00651	0.00657	0.00655
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01499	0.01481	0.04061
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)	0.00651	0.00666	0.00655
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00700	0.00709	0.00704
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00651	0.00658	0.00655
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01500	0.01482	0.04062

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)	-0.00080	-0.00055	0.04110
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00657	0.00630	0.04943
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00647	0.00619	0.04939
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00060	-0.00029	0.04122
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00307	0.00382	0.07988
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00078	-0.00055	0.04110
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00658	0.00630	0.04943
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00648	0.00619	0.04938
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00059	-0.00029	0.04123
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00308	0.00382	0.07989

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)	0.03046	0.03113	0.08097
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01343	0.01467	0.05679
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02073	0.02157	0.06431
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02080	0.02159	0.06438
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02918	0.03111	0.10076
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01440	0.01550	0.05710
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01810	0.02031	0.09685
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03047	0.03112	0.08097
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01344	0.01467	0.05680
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02073	0.02158	0.06432
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02080	0.02159	0.06438
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02918	0.03111	0.10076
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01441	0.01550	0.05710
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01810	0.02031	0.09686

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00278	0.00534	0.00871	1.37593	1.36640
sky130_osu_sc_12T_ms__dffs_l	0.00278	0.00534	0.00871	0.96342	0.96296

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.88045	2.46047
sky130_osu_sc_12T_ms__dffs_l	0.00000	1.44366	3.02369

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)	0.19879	1.16560	14.66880
	QN->Q (FR)	0.02553	0.74645	12.06060
	SN->Q (FR)	0.15445	1.23074	15.93960
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.19925	1.25602	14.10050
	QN->Q (FR)	0.02772	0.76524	11.26780
	SN->Q (FR)	0.15498	1.31634	15.35030

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)	0.29611	1.31476	15.60450
	QN->Q (RF)	0.02056	0.57391	9.26928
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.29621	1.43130	15.32360
	QN->Q (RF)	0.02239	0.59408	8.82105

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)	0.26671	0.75802	6.71813
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.26283	0.80798	6.68851

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)	0.16483	0.54520	4.77676
	SN->QN (FF)	0.12006	0.61099	6.04677
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.16256	0.57591	4.67146
	SN->QN (FF)	0.11815	0.63638	5.91899

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)	-0.04143	-0.05387	0.04391
	setup	CK (R)	0.14490	0.17705	0.99006
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04020	-0.05529	0.04631
	setup	CK (R)	0.14493	0.17682	0.95739

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)	-0.11276	-0.28395	-2.20538
	setup	CK (R)	0.14018	0.29490	3.29357
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11167	-0.28582	-2.25887
	setup	CK (R)	0.14017	0.29490	3.29352

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)	-0.04143	-0.05387	0.04391
	setup	CK (R)	0.14490	0.17705	0.99006
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.04020	-0.05529	0.04631
	setup	CK (R)	0.14493	0.17682	0.95739

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)	-0.11276	-0.28395	-2.20538
	setup	CK (R)	0.14018	0.29490	3.29357
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11167	-0.28582	-2.25887
	setup	CK (R)	0.14017	0.29490	3.29352

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)	0.04149	0.06731	5.36835
	removal	CK (R)	-0.01998	-0.05307	-0.43269
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04143	0.06729	5.22282
	removal	CK (R)	-0.01998	-0.05307	-0.43269

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)	0.04149	0.06731	5.36835
	removal	CK (R)	-0.01998	-0.05307	-0.43269
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.04143	0.06729	5.22282
	removal	CK (R)	-0.01998	-0.05307	-0.43269

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 ()	0.10641	0.41016	13.33370
	min_pulse_width	SN ()	0.10951	0.41016	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.10331	0.41016	13.33370
	min_pulse_width	SN ()	0.10331	0.41016	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 ()	0.08471	0.41016	13.33370
	min_pulse_width	CK ()	0.14670	0.41016	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.08162	0.41016	13.33370
	min_pulse_width	CK ()	0.14360	0.41016	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 ()	0.20249	0.41016	13.33370
	min_pulse_width	CK ()	0.12191	0.41016	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.20249	0.41016	13.33370
	min_pulse_width	CK ()	0.12191	0.41016	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	0.00865	0.00775	0.01339
	SN	-0.00111	-0.07432	-1.22874
	SN	0.01578	0.01542	0.02957
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00776	0.00745	0.02664
	SN	-0.00111	-0.06001	-0.86036
	SN	0.01490	0.01516	0.04245

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	0.00982	0.00849	0.00598
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00894	0.00821	0.01829

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	0.00981	0.00849	0.00613
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00894	0.00821	0.01819

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	0.00861	0.00772	0.01380
	SN	-0.00111	-0.07401	-1.22016
	SN	0.01576	0.01541	0.02932
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00772	0.00744	0.02621
	SN	-0.00111	-0.06000	-0.85992
	SN	0.01486	0.01514	0.04175

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	-0.00254	-0.00258	-0.00259
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01062	0.01060	0.03838
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00429	0.00428	0.03058
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00253	-0.00258	-0.00258
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01062	0.01060	0.03839
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00430	0.00429	0.03058

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	0.00265	0.00263	0.00262
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01639	0.01643	0.04351
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00827	0.00848	0.03505
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00266	0.00264	0.00262
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01640	0.01643	0.04351
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00828	0.00849	0.03506

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)	-0.00474	-0.00477	-0.00478
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00314	0.00329	0.04306
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)	-0.00474	-0.00477	-0.00477
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00314	0.00330	0.04306

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)	0.00480	0.00478	0.00479
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01036	0.01147	0.05279
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)	0.00481	0.00478	0.00479
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01037	0.01147	0.05280

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)	-0.00071	-0.00047	0.04125
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00065	-0.00033	0.04124
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00270	0.00352	0.08006
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00071	-0.00046	0.04125
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00065	-0.00032	0.04125
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00270	0.00353	0.08006

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)	0.02704	0.02769	0.07871
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01319	0.01445	0.05663
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02613	0.02812	0.09790
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01433	0.01545	0.05709
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01712	0.01948	0.09644
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02710	0.02770	0.07872
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01320	0.01446	0.05663
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02613	0.02812	0.09791
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01433	0.01546	0.05710
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01712	0.01949	0.09645

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00293	0.00857	1.21974
sky130_osu_sc_12T_ms__dff_l	0.00293	0.00855	0.88625

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.11348	0.13839
sky130_osu_sc_12T_ms__dff_l	0.00000	0.67670	0.70161

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)**	0.16943	0.65681	6.42389
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.16917	0.70908	6.39617

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)**	0.24933	0.61110	4.43843
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.24965	0.65072	4.48415

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)	-0.03941	-0.05236	0.02693
	setup	CK (R)	0.11711	0.15544	0.96126
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.03938	-0.05236	0.02683
	setup	CK (R)	0.11719	0.15606	0.94774

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)	-0.10170	-0.28221	-2.21251
	setup	CK (R)	0.12197	0.29317	3.29058
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.09970	-0.28221	-2.27565
	setup	CK (R)	0.12197	0.29317	3.29058

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 ()	0.07542	0.41016	13.33370
	min_pulse_width	CK ()	0.13431	0.41016	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.07232	0.41016	13.33370
	min_pulse_width	CK ()	0.13121	0.41016	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 ()**	0.17460	0.41016	13.33370
	min_pulse_width	**CK ()**	0.09711	0.41016	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.17460	0.41016	13.33370
	min_pulse_width	**CK ()**	0.09711	0.41016	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	0.01817	0.01884	0.08132
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01635	0.01711	0.07952

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	0.02003	0.01984	0.06301
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01828	0.01817	0.06140

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	-0.00208	-0.00251	-0.00253
	!CK	0.00000	0.00000	0.00000
	!CK	0.00961	0.00955	0.03677
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00207	-0.00250	-0.00253
	!CK	0.00000	0.00000	0.00000
	!CK	0.00961	0.00956	0.03677

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	0.00252	0.00254	0.00253
	!CK	0.00000	0.00000	0.00000
	!CK	0.01694	0.01705	0.04422
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00252	0.00255	0.00254
	!CK	0.00000	0.00000	0.00000
	!CK	0.01694	0.01706	0.04423

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)	-0.00075	-0.00050	0.04124
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00067	-0.00033	0.04126
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00075	-0.00049	0.04124
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00066	-0.00033	0.04126

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)	0.01315	0.01442	0.05662
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02602	0.02678	0.07800
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02651	0.02865	0.09915
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01423	0.01540	0.05701
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.01316	0.01443	0.05662
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.02602	0.02678	0.07800
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.02651	0.02865	0.09916
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01423	0.01540	0.05702

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00283	1.23061
sky130_osu_sc_12T_ms__inv_10	0.02532	12.18659
sky130_osu_sc_12T_ms__inv_2	0.00526	2.54815
sky130_osu_sc_12T_ms__inv_3	0.00779	3.72338
sky130_osu_sc_12T_ms__inv_4	0.01025	5.01132
sky130_osu_sc_12T_ms__inv_6	0.01535	7.47223
sky130_osu_sc_12T_ms__inv_8	0.02033	9.90366
sky130_osu_sc_12T_ms__inv_l	0.00223	0.83574

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.01730	0.03418
sky130_osu_sc_12T_ms__inv_10	0.00000	0.17296	0.34181
sky130_osu_sc_12T_ms__inv_2	0.00000	0.03459	0.06836
sky130_osu_sc_12T_ms__inv_3	0.00000	0.05189	0.10254
sky130_osu_sc_12T_ms__inv_4	0.00000	0.06918	0.13672
sky130_osu_sc_12T_ms__inv_6	0.00000	0.10378	0.20508
sky130_osu_sc_12T_ms__inv_8	0.00000	0.13837	0.27344
sky130_osu_sc_12T_ms__inv_l	0.00000	0.29890	0.59761

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)**	0.02454	0.67454	10.65610
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.02867	0.43351	10.56980
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01818	0.57158	10.60280
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.01958	0.53190	10.61350
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.01938	0.50074	10.56210
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02160	0.46753	10.57330
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02485	0.44679	10.57630
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02781	0.69905	9.99628

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)**	0.01892	0.50259	7.92354
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.02440	0.31731	8.16723
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01496	0.43601	8.11049
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01617	0.40599	8.18927
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01588	0.37921	8.19068
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.01873	0.35013	8.22339
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02152	0.33122	8.22814
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02141	0.52899	7.58385

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	0.00432	0.00462	0.01198
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03535	0.04519	0.11308
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00740	0.00903	0.02254
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01140	0.01366	0.03450
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01449	0.01785	0.04513
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02147	0.02672	0.06793
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02838	0.03696	0.09053
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00338	0.00383	0.01535

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	-0.00080	-0.00038	0.00350
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01337	-0.00880	0.03100
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00258	-0.00164	0.00606
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00340	-0.00229	0.00959
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00526	-0.00367	0.01220
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00803	-0.00542	0.01828
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01083	-0.00686	0.02450
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00056	-0.00040	0.00314

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ms__mux2_1	0.35702	0.35713	0.00583	0.36567

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.03594	0.03927

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)	-	0.01099	0.23027	2.53118
	A1->Y (RR)	-	0.01274	0.23381	2.53342
	S0->Y (RR)	(!A0 * A1)	0.04019	0.26474	1.55695
	S0->Y (FR)	(A0 * !A1)	0.02690	0.35228	3.50526

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)	-	0.01250	0.24115	2.65710
	A1->Y (FF)	-	0.01126	0.23887	2.65156
	S0->Y (FF)	(!A0 * A1)	0.05273	0.32728	2.51197
	S0->Y (RF)	(A0 * !A1)	0.02093	0.27552	2.50839

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	-	-0.00421	-0.00421	-0.00421
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00270	-0.00269	-0.00270
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00569	0.00727	0.05014
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00275	-0.00199	0.04029

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	-	0.00421	0.00421	0.00421
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00270	0.00270	0.00270
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00065	0.00158	0.04427
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01167	0.01308	0.05527

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)	-0.00099	-0.00099	-0.00099

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)	0.00099	0.00099	0.00099

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)	-0.00118	-0.00118	-0.00118

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)	0.00118	0.00118	0.00118

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)	-0.00107	-0.00022	0.04221
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00104	-0.00023	0.04228

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)	0.00904	0.01049	0.05279
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00831	0.00991	0.05257

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00282	0.00282	1.21309
sky130_osu_sc_12T_ms__nand2_l	0.00218	0.00221	0.83131

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.01731	0.06836
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.29892	1.19522

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)	0.02554	0.67682	10.60170
	B->Y (FR)	0.02924	0.64976	10.10870
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.02804	0.70366	9.97391
	B->Y (FR)	0.03384	0.70490	9.95874

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)	0.02747	0.63970	9.91537
	B->Y (RF)	0.03129	0.61690	9.44385
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.03075	0.68097	9.53559
	B->Y (RF)	0.03442	0.65480	9.00084

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	0.00459	0.00525	0.01139
	B	0.00000	0.00000	0.00000
	B	0.00588	0.00650	0.01288
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00343	0.00395	0.01345
	B	0.00000	0.00000	0.00000
	B	0.00434	0.00454	0.01456

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	-0.00055	-0.00044	0.00314
	B	0.00000	0.00000	0.00000
	B	-0.00053	-0.00053	0.00245
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00033	-0.00025	0.00277
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00031	0.00222

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)	-0.00294	-0.00296	-0.00297
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00207	-0.00209	-0.00210

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)	0.00297	0.00300	0.00298
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00209	0.00212	0.00210

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)	-0.00274	-0.00275	-0.00274
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00196	-0.00196	-0.00196

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)	0.00279	0.00277	0.00275
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00198	0.00198	0.00196

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00278	0.00305	0.67524
sky130_osu_sc_12T_ms__nor2_l	0.00209	0.00231	0.48097

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.01342	0.03418
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.19818	0.59760

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)	0.05331	0.78597	10.11410
	B->Y (FR)	0.04171	0.78983	10.46020
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.05610	0.82979	9.70451
	B->Y (FR)	0.04691	0.82935	9.92721

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)	0.02549	0.42161	5.55843
	B->Y (RF)	0.02023	0.41078	5.54311
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.02699	0.44609	5.43329
	B->Y (RF)	0.02252	0.43828	5.41960

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	0.00612	0.00612	0.01179
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00534	0.01420
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00443	0.00451	0.01202
	B	0.00000	0.00000	0.00000
	B	0.00355	0.00408	0.01747

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	0.00063	0.00068	0.00615
	B	0.00000	0.00000	0.00000
	B	-0.00061	-0.00012	0.00496
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00046	0.00052	0.00535
	B	0.00000	0.00000	0.00000
	B	-0.00037	-0.00018	0.00444

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)	-0.00208	-0.00253	-0.00256
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00135	-0.00171	-0.00173

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)	0.00255	0.00256	0.00256
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00175	0.00175	0.00175

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)	-0.00116	-0.00117	-0.00116
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00081	-0.00082	-0.00082

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)	0.00121	0.00122	0.00117
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00085	0.00085	0.00083

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00282	0.00292	0.00248	0.66070

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.23096	0.63179

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)	0.05992	0.80372	10.36580
	A1->Y (FR)	0.07408	0.80364	10.02200
	B0->Y (FR)	0.03451	0.64629	8.70605

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)	0.03819	0.50384	6.40888
	A1->Y (RF)	0.04563	0.50211	6.30872
	B0->Y (RF)	0.02955	0.53389	7.15857

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	0.00665	0.00706	0.01485
	A1	0.00000	0.00000	0.00000
	A1	0.00808	0.00800	0.01312
	B0	0.00392	0.00485	0.01914

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00024	0.00023	0.00413
	A1	0.00000	0.00000	0.00000
	A1	0.00151	0.00131	0.00532
	B0	0.00060	0.00072	0.00543

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)	-0.00116	-0.00117	-0.00116
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00257	-0.00260	-0.00259
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00263	-0.00265	-0.00263

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)	0.00122	0.00123	0.00119
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00258	0.00260	0.00259
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00265	0.00266	0.00264

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)	-0.00199	-0.00248	-0.00247
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00253	-0.00258	-0.00257
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00260	-0.00262	-0.00260

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)	0.00245	0.00248	0.00248
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00255	0.00258	0.00257
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00261	0.00263	0.00261

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)	-0.00219	-0.00219	-0.00223

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)	0.00223	0.00228	0.00224

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00266	0.00278	0.00296	0.00292	0.70302

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.02012	0.06836

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)	0.07819	0.80100	10.09980
	A1->Y (FR)	0.06720	0.80710	10.46790
	B0->Y (FR)	0.04478	0.78575	10.45060
	B1->Y (FR)	0.05687	0.78033	10.08250

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)	0.06246	0.54701	6.73086
	A1->Y (RF)	0.05065	0.53121	6.68815
	B0->Y (RF)	0.04287	0.56166	7.44734
	B1->Y (RF)	0.05522	0.58053	7.51618

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	0.01033	0.01027	0.01512
	A1	0.00891	0.00914	0.01705
	B0	0.00497	0.00532	0.01364
	B1	0.00651	0.00646	0.01153

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00233	0.00216	0.00604
	A1	-0.00019	-0.00020	0.00370
	B0	-0.00025	0.00012	0.00482
	B1	0.00097	0.00091	0.00583

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)	-0.00205	-0.00250	-0.00250
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00205	-0.00250	-0.00250
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00246	-0.00249	-0.00249
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00251	-0.00253	-0.00252

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)	0.00248	0.00251	0.00250
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00248	0.00251	0.00250
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00249	0.00251	0.00249
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00253	0.00255	0.00253

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)	-0.00113	-0.00114	-0.00113
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00113	-0.00114	-0.00113
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00245	-0.00247	-0.00248
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00251	-0.00253	-0.00252

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)	0.00118	0.00119	0.00115
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00118	0.00119	0.00115
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00246	0.00247	0.00248
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00252	0.00255	0.00252

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)	-0.00114	-0.00115	-0.00114
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00114	-0.00116	-0.00114
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00288	-0.00293	-0.00291
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00288	-0.00289	-0.00294

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)	0.00119	0.00120	0.00116
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00119	0.00121	0.00116
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00292	0.00294	0.00291
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00294	0.00300	0.00295

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)	-0.00203	-0.00249	-0.00249
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00203	-0.00249	-0.00249
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00293	-0.00299	-0.00298
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00292	-0.00294	-0.00299

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)	0.00247	0.00249	0.00249
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00247	0.00250	0.00249
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00298	0.00301	0.00298
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00299	0.00303	0.00301

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00314	0.00290	1.26853
sky130_osu_sc_12T_ms__or2_2	0.00314	0.00290	2.59313
sky130_osu_sc_12T_ms__or2_4	0.00314	0.00290	5.13275
sky130_osu_sc_12T_ms__or2_8	0.00314	0.00290	10.00921
sky130_osu_sc_12T_ms__or2_l	0.00235	0.00220	0.89022

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.02227	0.03500
sky130_osu_sc_12T_ms__or2_2	0.00000	0.03113	0.06918
sky130_osu_sc_12T_ms__or2_4	0.00000	0.04883	0.13755
sky130_osu_sc_12T_ms__or2_8	0.00000	0.08425	0.27427
sky130_osu_sc_12T_ms__or2_l	0.00000	0.34772	0.59800

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)	0.06091	0.55378	6.43255
	B->Y (RR)	0.05297	0.52807	6.33475
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.06500	0.47528	6.41052
	B->Y (RR)	0.05681	0.45214	6.31318
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.08399	0.46115	6.64585
	B->Y (RR)	0.07557	0.44258	6.55121
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.12116	0.49770	6.96498
	B->Y (RR)	0.11256	0.48325	6.88090
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.06403	0.60414	6.34821
	B->Y (RR)	0.05682	0.58117	6.30915

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)	0.10121	0.54941	5.92441
	B->Y (FF)	0.08442	0.54278	6.04134
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.11949	0.53852	6.20623
	B->Y (FF)	0.10297	0.53708	6.30825
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.16851	0.58255	6.57037
	B->Y (FF)	0.15205	0.58909	6.66116
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.26984	0.69362	6.93770
	B->Y (FF)	0.25350	0.70100	7.03875
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.10633	0.57776	5.75759
	B->Y (FF)	0.09106	0.56869	5.86849

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	0.00465	0.00475	0.02487
	B	0.00000	0.00000	0.00000
	B	0.00346	0.00420	0.02730
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00772	0.00812	0.02911
	B	0.00000	0.00000	0.00000
	B	0.00649	0.00744	0.03122
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01483	0.01563	0.03683
	B	0.00000	0.00000	0.00000
	B	0.01357	0.01512	0.03884
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03007	0.03092	0.05236
	B	0.00000	0.00000	0.00000
	B	0.02883	0.03040	0.05449
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00353	0.00387	0.02458
	B	0.00000	0.00000	0.00000
	B	0.00271	0.00354	0.03156

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	0.01029	0.01028	0.03191
	B	0.00000	0.00000	0.00000
	B	0.00855	0.00980	0.04284
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01279	0.01292	0.03430
	B	0.00000	0.00000	0.00000
	B	0.01103	0.01238	0.04447
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01996	0.01928	0.04015
	B	0.00000	0.00000	0.00000
	B	0.01810	0.01856	0.04901
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03939	0.03307	0.05258
	B	0.00000	0.00000	0.00000
	B	0.03808	0.03146	0.05987
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00764	0.00803	0.03169
	B	0.00000	0.00000	0.00000
	B	0.00644	0.00806	0.04480

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)	-0.00210	-0.00257	-0.00258
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00210	-0.00258	-0.00258
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00211	-0.00258	-0.00258
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00210	-0.00258	-0.00258
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00134	-0.00173	-0.00174

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)	0.00256	0.00257	0.00258
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00256	0.00258	0.00258
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00256	0.00258	0.00258
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00256	0.00258	0.00258
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00175	0.00178	0.00176

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)	-0.00116	-0.00117	-0.00117
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00116	-0.00117	-0.00117
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00116	-0.00117	-0.00117
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00116	-0.00117	-0.00117
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00080	-0.00080

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)	0.00122	0.00123	0.00118
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00123	0.00118
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00123	0.00118
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00122	0.00123	0.00118
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00083	0.00084	0.00081

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00303	0.00397	0.70225
sky130_osu_sc_12T_ms__tbufi_l	0.00232	0.00303	0.47965

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.01757	0.06836
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.29906	1.19521

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)	0.03852	0.77725	10.43550
	OE->Y (FR)	0.04130	0.32383	5.24757
	OE->Y (RR)	0.06757	0.63069	6.43880
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.04523	0.82619	9.89045
	OE->Y (FR)	0.04166	0.32380	5.24751
	OE->Y (RR)	0.07285	0.70201	6.41304

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)	0.02701	0.51975	7.06986
	OE->Y (FF)	0.04177	0.32384	5.24756
	OE->Y (RF)	0.02546	0.49179	6.52992
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.03062	0.54731	6.78105
	OE->Y (FF)	0.04221	0.32381	5.24749
	OE->Y (RF)	0.02840	0.51662	6.19116

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	0.00443	0.00496	0.01280
	OE	0.00000	0.00000	0.00000
	OE	0.00432	0.00526	0.04251
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00335	0.00385	0.01529
	OE	0.00000	0.00000	0.00000
	OE	0.00315	0.00439	0.04744

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	-0.00062	-0.00025	0.00421
	OE	0.00000	0.00000	0.00000
	OE	0.00261	0.00359	0.04680
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00035	-0.00008	0.00375
	OE	0.00000	0.00000	0.00000
	OE	0.00185	0.00320	0.05026

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)	-0.00205	-0.00208	-0.00206
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00180	-0.00182	-0.00181
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00148	-0.00150	-0.00149
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00131	-0.00133	-0.00131

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)	0.00205	0.00208	0.00206
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00184	0.00186	0.00182
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00148	0.00150	0.00149
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00134	0.00134	0.00132

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)	0.00156	0.00264	0.04640
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00136	0.00241	0.04616
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00112	0.00255	0.05020
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00093	0.00235	0.04999

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)	0.00533	0.00711	0.05037
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00538	0.00712	0.05046
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00406	0.00603	0.05372
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00404	0.00608	0.05378

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00302	0.00448	0.70231
sky130_osu_sc_12T_ms__tnbufi_l	0.00222	0.00339	0.48040

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.02883	0.03459
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.49820	0.59783

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)	0.03879	0.77715	10.43580
	OE->Y (RR)	0.02500	0.32407	5.24780
	OE->Y (FR)	0.04771	0.77068	10.03650
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.04437	0.82391	9.89554
	OE->Y (RR)	0.02718	0.32387	5.24756
	OE->Y (FR)	0.05182	0.82534	9.61241

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)	0.02647	0.51890	7.07004
	OE->Y (RF)	0.02485	0.32407	5.24780
	OE->Y (FF)	0.04831	0.46134	4.85189
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.02924	0.54600	6.78638
	OE->Y (RF)	0.02706	0.32383	5.24755
	OE->Y (FF)	0.05283	0.48471	4.57207

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	0.00459	0.00512	0.01295
	OE	0.00000	0.00000	0.00000
	OE	0.01103	0.01286	0.05661
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00343	0.00399	0.01526
	OE	0.00000	0.00000	0.00000
	OE	0.00833	0.01062	0.05829

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	-0.00083	-0.00044	0.00401
	OE	0.00000	0.00000	0.00000
	OE	0.00949	0.01161	0.04998
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00059	-0.00029	0.00351
	OE	0.00000	0.00000	0.00000
	OE	0.00719	0.00970	0.05388

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)	-0.00168	-0.00171	-0.00169
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00146	-0.00147	-0.00146
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00115	-0.00117	-0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00099	-0.00101	-0.00100

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)	0.00168	0.00171	0.00169
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00149	0.00149	0.00147
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00115	0.00117	0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00102	0.00103	0.00101

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)	-0.00281	-0.00207	0.04207
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00284	-0.00203	0.04211
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00187	-0.00072	0.04709
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00196	-0.00073	0.04710

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)	0.00824	0.01036	0.05445
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00813	0.01017	0.05434
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00632	0.00882	0.05669
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00624	0.00863	0.05661

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xnor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_l	0.00605	0.00518	0.72862

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.05991	0.10296

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	0.08586	0.66409	6.63015
	A->Y (FR)	!B	0.05202	0.79283	10.55170
	B->Y (RR)	A	0.07026	0.65063	6.69605
	B->Y (FR)	!A	0.06538	0.78862	10.18990

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	0.08178	0.53046	5.21025
	A->Y (RF)	!B	0.03678	0.50880	6.72261
	B->Y (FF)	A	0.07116	0.52099	5.21050
	B->Y (RF)	!A	0.04528	0.51929	6.72582

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	0.00460	0.00528	0.04412
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01125	0.01335	0.06450
	B	A	0.00000	0.00000	0.00000
	B	A	0.00191	0.00305	0.04726
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01195	0.01347	0.06116

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	0.01318	0.01445	0.05711
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00288	0.00377	0.05073
	B	A	0.00000	0.00000	0.00000
	B	A	0.01197	0.01392	0.05761
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00377	0.00460	0.05113

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00608	0.00522	0.69933

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.05991	0.09967

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	0.09036	0.68260	6.83279
	A->Y (FR)	B	0.06732	0.81133	10.39860
	B->Y (RR)	!A	0.07449	0.67553	6.84328
	B->Y (FR)	A	0.07416	0.81836	10.38910

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	0.07751	0.52338	4.98658
	A->Y (RF)	B	0.03866	0.53679	7.05800
	B->Y (FF)	!A	0.07363	0.52131	5.08830
	B->Y (RF)	A	0.04434	0.51216	6.54559

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	0.01306	0.01446	0.06105
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00278	0.00281	0.04472
	B	A	0.00000	0.00000	0.00000
	B	A	0.01331	0.01481	0.06061
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00186	0.00280	0.04575

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	0.00240	0.00309	0.04913
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01377	0.01550	0.05282
	B	A	0.00000	0.00000	0.00000
	B	A	0.00244	0.00309	0.04774
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01211	0.01408	0.05671

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.43877
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	210203.00000	420406.00000
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
	-0.00161	0.04949	0.79635

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
	3.65929	3.49854	0.95717