sky130_osu_sc_12T_ms_ff_1P56_-40C.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_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.01022	0.01031	0.00797	1.24680	0.53992	1.08946
sky130_osu_sc_12T_ms__addf_l	0.01022	0.01031	0.00799	0.85667	0.54040	1.09062

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.03241	0.04224
sky130_osu_sc_12T_ms__addf_l	0.00000	0.13972	0.25685

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)	0.11511	1.42621	21.51020
	B->CO (RR)	0.10325	1.35917	20.60600
	CI->CO (RR)	0.10790	1.43420	21.78230
	CON->CO (FR)	0.02325	0.72078	11.61320
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.11274	1.30277	17.28380
	B->CO (RR)	0.10623	1.25361	16.79310
	CI->CO (RR)	0.10554	1.31163	17.61110
	CON->CO (FR)	0.02674	0.74361	10.89820

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)	0.20335	2.12089	31.47140
	B->CO (FF)	0.17873	2.01685	30.13320
	CI->CO (FF)	0.17942	2.08264	31.32550
	CON->CO (RF)	0.01646	0.47388	7.61986
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.19806	1.87237	24.35650
	B->CO (FF)	0.17407	1.78532	23.43690
	CI->CO (FF)	0.17411	1.83498	24.23490
	CON->CO (RF)	0.01797	0.48504	7.15342

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)	0.16542	1.01877	11.54480
	B->CON (FR)	0.14120	0.95713	11.12960
	CI->CON (FR)	0.14154	0.98256	11.46000
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.15811	1.01193	11.54390
	B->CON (FR)	0.13454	0.95125	11.14510
	CI->CON (FR)	0.13425	0.97570	11.45910

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)	0.06585	0.47990	5.63591
	B->CON (RF)	0.06101	0.46935	5.56606
	CI->CON (RF)	0.05864	0.49105	5.93202
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.06407	0.47814	5.63665
	B->CON (RF)	0.05935	0.46757	5.56684
	CI->CON (RF)	0.05686	0.48935	5.93285

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)	0.29109	1.96684	24.57010
	B->S (-R)	0.28201	1.92329	23.77660
	CI->S (-R)	0.26550	1.92523	24.42590
	CON->S (RR)	0.06943	0.62424	6.80019
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.28118	1.96055	24.58860
	B->S (-R)	0.27247	1.91740	23.79340
	CI->S (-R)	0.25552	1.91909	24.44000
	CON->S (RR)	0.06946	0.62450	6.80724

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)	0.20235	1.20412	13.94230
	B->S (-F)	0.21301	1.17384	13.57140
	CI->S (-F)	0.19463	1.21009	14.23320
	CON->S (FF)	0.09208	0.59123	5.82503
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.19814	1.20175	13.95050
	B->S (-F)	0.20924	1.17129	13.57960
	CI->S (-F)	0.19035	1.20765	14.24180
	CON->S (FF)	0.09203	0.59134	5.82953

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	0.00179	0.00185	0.00378
	B	0.00249	0.00249	0.00394
	CI	0.00248	0.00260	0.00454
sky130_osu_sc_12T_ms__addf_l	A	0.00162	0.00168	0.00322
	B	0.00232	0.00231	0.00365
	CI	0.00231	0.00241	0.00424

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00606	0.00621	0.01166
	B	0.00631	0.00646	0.01108
	CI	0.00520	0.00539	0.01092
sky130_osu_sc_12T_ms__addf_l	A	0.00592	0.00602	0.00952
	B	0.00616	0.00627	0.00913
	CI	0.00506	0.00518	0.00895

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00606	0.00613	0.00813
	B	0.00633	0.00633	0.00802
	CI	0.00555	0.00571	0.00756
sky130_osu_sc_12T_ms__addf_l	A	0.00592	0.00597	0.00797
	B	0.00619	0.00618	0.00787
	CI	0.00540	0.00555	0.00740

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00212	0.00202	0.00277
	B	0.00247	0.00242	0.00321
	CI	0.00247	0.00255	0.00352
sky130_osu_sc_12T_ms__addf_l	A	0.00195	0.00185	0.00277
	B	0.00230	0.00225	0.00328
	CI	0.00230	0.00239	0.00362

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00606	0.00620	0.01082
	B	0.00631	0.00645	0.01031
	CI	0.00520	0.00536	0.01024
sky130_osu_sc_12T_ms__addf_l	A	0.00592	0.00605	0.01076
	B	0.00616	0.00630	0.01016
	CI	0.00506	0.00521	0.01009

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01310	0.01304	0.01507
	B	0.01203	0.01166	0.01669
	CI	0.01079	0.01061	0.01272
sky130_osu_sc_12T_ms__addf_l	A	0.01311	0.01305	0.01507
	B	0.01204	0.01167	0.01670
	CI	0.01081	0.01062	0.01272

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00504	0.00530	1.20371	1.22673	1.25612
sky130_osu_sc_12T_ms__addh_l	0.00504	0.00531	0.85114	1.23973	0.87097

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.03952	0.04219
sky130_osu_sc_12T_ms__addh_l	0.00000	0.25395	0.25675

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)	0.07924	0.60669	6.54955
	B->CO (RR)	0.08194	0.61582	6.66290
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.07723	0.63899	6.25239
	B->CO (RR)	0.07989	0.64941	6.36355

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)	0.07496	0.57803	6.21405
	B->CO (FF)	0.07945	0.59102	6.24835
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.07382	0.58840	5.90388
	B->CO (FF)	0.07816	0.60207	5.94345

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)	0.11423	0.62338	6.45508
	B->CON (RR)	0.11696	0.63104	6.56599
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.10695	0.61363	6.48530
	B->CON (RR)	0.10968	0.62248	6.59799

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)	0.09859	0.59382	6.25260
	B->CON (FF)	0.09862	0.60273	6.28159
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.09226	0.57948	6.18586
	B->CON (FF)	0.09234	0.58905	6.21468

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)	0.14049	1.26348	16.62930
	B->S (FR)	0.14079	1.27402	16.69560
	CON->S (FR)	0.02486	0.73386	11.84070
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.13382	1.18329	13.67010
	B->S (FR)	0.13418	1.19332	13.70980
	CON->S (FR)	0.02742	0.74996	11.04360

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)	0.14418	1.15951	14.79160
	B->S (RF)	0.14672	1.16699	14.90330
	CON->S (RF)	0.01603	0.47539	7.68453
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.13827	1.04031	11.22230
	B->S (RF)	0.14092	1.04928	11.33230
	CON->S (RF)	0.01750	0.48804	7.26033

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	0.00324	0.00307	0.00437
	B	0.00000	0.00000	0.00000
	B	0.00301	0.00283	0.00417
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00270	0.00441
	B	0.00000	0.00000	0.00000
	B	0.00267	0.00247	0.00415

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	0.00442	0.00428	0.00623
	B	0.00000	0.00000	0.00000
	B	0.00466	0.00474	0.00672
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00395	0.00624
	B	0.00000	0.00000	0.00000
	B	0.00432	0.00439	0.00662

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00323	0.00307	0.00440
	B	0.00000	0.00000	0.00000
	B	0.00301	0.00283	0.00420
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00271	0.00423
	B	0.00000	0.00000	0.00000
	B	0.00267	0.00247	0.00398

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	0.00442	0.00428	0.00625
	B	0.00000	0.00000	0.00000
	B	0.00467	0.00474	0.00674
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00394	0.00611
	B	0.00000	0.00000	0.00000
	B	0.00432	0.00438	0.00652

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	0.00443	0.00429	0.00633
	B	0.00000	0.00000	0.00000
	B	0.00467	0.00475	0.00675
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00395	0.00619
	B	0.00000	0.00000	0.00000
	B	0.00432	0.00439	0.00657

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00323	0.00307	0.00434
	B	0.00000	0.00000	0.00000
	B	0.00300	0.00284	0.00425
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00290	0.00270	0.00423
	B	0.00000	0.00000	0.00000
	B	0.00267	0.00247	0.00412

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)	1.00926	0.96635	0.27773
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	1.00930	0.96640	0.27777

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)	1.00906	0.96489	0.26459
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	1.00910	0.96493	0.26464

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00270	0.00280	1.19937
sky130_osu_sc_12T_ms__and2_2	0.00271	0.00281	2.39503
sky130_osu_sc_12T_ms__and2_4	0.00270	0.00281	4.59915
sky130_osu_sc_12T_ms__and2_6	0.00274	0.00281	6.79413
sky130_osu_sc_12T_ms__and2_8	0.00271	0.00281	8.90872
sky130_osu_sc_12T_ms__and2_l	0.00211	0.00218	0.86591

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.01755	0.02803
sky130_osu_sc_12T_ms__and2_2	0.00000	0.02805	0.02812
sky130_osu_sc_12T_ms__and2_4	0.00000	0.04905	0.05600
sky130_osu_sc_12T_ms__and2_6	0.00000	0.07005	0.08394
sky130_osu_sc_12T_ms__and2_8	0.00000	0.09105	0.11188
sky130_osu_sc_12T_ms__and2_l	0.00000	0.28585	0.45731

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)	0.06024	0.55110	6.32785
	B->Y (RR)	0.06453	0.56535	6.33288
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.06740	0.48870	6.44767
	B->Y (RR)	0.07159	0.49845	6.46951
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.09236	0.48307	6.65884
	B->Y (RR)	0.09642	0.48827	6.69854
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.11720	0.50509	6.88168
	B->Y (RR)	0.12134	0.50640	6.92634
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.14131	0.53096	7.10120
	B->Y (RR)	0.14542	0.53215	7.15268
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.06358	0.59631	6.47152
	B->Y (RR)	0.06761	0.60618	6.37068

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)	0.05948	0.51560	5.66493
	B->Y (FF)	0.06164	0.52692	5.70165
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.06922	0.50134	5.85943
	B->Y (FF)	0.07077	0.50811	5.88898
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.09741	0.52865	6.13728
	B->Y (FF)	0.09678	0.52923	6.16237
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.12702	0.56408	6.38435
	B->Y (FF)	0.12408	0.56206	6.40440
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.15454	0.59743	6.55207
	B->Y (FF)	0.14963	0.59159	6.56063
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.05871	0.50135	5.24397
	B->Y (FF)	0.06421	0.51662	5.25396

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	0.00214	0.00189	0.00898
	B	0.00000	0.00000	0.00000
	B	0.00219	0.00182	0.00563
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00397	0.00387	0.01043
	B	0.00000	0.00000	0.00000
	B	0.00402	0.00385	0.00734
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00819	0.00840	0.01386
	B	0.00000	0.00000	0.00000
	B	0.00821	0.00840	0.01127
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01243	0.01284	0.01801
	B	0.00000	0.00000	0.00000
	B	0.01251	0.01289	0.01561
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01676	0.01736	0.02231
	B	0.00000	0.00000	0.00000
	B	0.01674	0.01732	0.02064
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00168	0.00167	0.01615
	B	0.00000	0.00000	0.00000
	B	0.00173	0.00156	0.01154

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	0.00555	0.00564	0.01229
	B	0.00000	0.00000	0.00000
	B	0.00633	0.00644	0.01245
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00705	0.00738	0.01388
	B	0.00000	0.00000	0.00000
	B	0.00786	0.00813	0.01405
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01072	0.01154	0.01787
	B	0.00000	0.00000	0.00000
	B	0.01154	0.01224	0.01798
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01459	0.01585	0.02211
	B	0.00000	0.00000	0.00000
	B	0.01539	0.01640	0.02210
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01835	0.01987	0.02620
	B	0.00000	0.00000	0.00000
	B	0.01912	0.02036	0.02602
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00430	0.00489	0.01856
	B	0.00000	0.00000	0.00000
	B	0.00488	0.00531	0.01844

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)	-0.00183	-0.00185	-0.00184
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00185	-0.00184
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00185	-0.00184
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00184	-0.00187	-0.00186
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00184	-0.00184
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00131	-0.00132	-0.00132

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)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00186	0.00188	0.00187
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00132	0.00134	0.00133

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)	-0.00171	-0.00173	-0.00172
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00172	-0.00173	-0.00172
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00171	-0.00172	-0.00172
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00171	-0.00172	-0.00172
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00171	-0.00172	-0.00172
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00123	-0.00124	-0.00123

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)	0.00174	0.00174	0.00172
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00174	0.00174	0.00172
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00174	0.00174	0.00172
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00174	0.00173	0.00172
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00174	0.00173	0.00172
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00126	0.00126	0.00124

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00245	0.00264	0.00261	0.51269

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00679	0.01397

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)	0.08532	0.95255	11.43300
	A1->Y (FR)	0.06651	0.86759	10.73990
	B0->Y (FR)	0.06659	0.92444	11.45910

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)	0.03247	0.43219	5.36417
	A1->Y (RF)	0.02905	0.42749	5.36711
	B0->Y (RF)	0.02122	0.41054	5.28667

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	0.00455	0.00448	0.00464
	A1	0.00000	0.00000	0.00000
	A1	0.00377	0.00366	0.00385
	B0	0.00287	0.00288	0.00397

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	0.00092	0.00078	0.00098
	A1	0.00000	0.00000	0.00000
	A1	0.00094	0.00079	0.00114
	B0	-0.00033	-0.00037	0.00003

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)	-0.00132	-0.00145	-0.00144
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00147	-0.00148	-0.00147
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00147	-0.00148	-0.00147

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)	0.00143	0.00145	0.00144
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00147	0.00148	0.00147
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00149	0.00149	0.00147

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)	-0.00132	-0.00145	-0.00145
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00147	-0.00148	-0.00147
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00165	-0.00166	-0.00167

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)	0.00144	0.00145	0.00145
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00147	0.00149	0.00148
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00167	0.00169	0.00167

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)	-0.00073	-0.00074	-0.00074

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)	0.00081	0.00081	0.00076

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__aoi22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_1	0.00245	0.00264	0.00276	0.00257	0.50337

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.00762	0.02794

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)	0.11037	0.97900	11.38420
	A1->Y (FR)	0.09722	0.95960	11.32500
	B0->Y (FR)	0.07007	0.92366	11.34400
	B1->Y (FR)	0.08355	0.94152	11.42020

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)	0.04106	0.44037	5.32032
	A1->Y (RF)	0.03754	0.43399	5.32179
	B0->Y (RF)	0.02373	0.41665	5.30186
	B1->Y (RF)	0.02748	0.42185	5.30114

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	0.00571	0.00562	0.00576
	A1	0.00464	0.00452	0.00471
	B0	0.00311	0.00307	0.00416
	B1	0.00481	0.00474	0.00575

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00183	0.00169	0.00187
	A1	0.00184	0.00173	0.00202
	B0	-0.00019	-0.00019	0.00013
	B1	-0.00015	-0.00021	-0.00000

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)	-0.00135	-0.00145	-0.00144
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00146	-0.00147	-0.00147
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00147	-0.00147	-0.00147
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00147	-0.00147	-0.00147

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)	0.00143	0.00146	0.00144
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00146	0.00148	0.00147
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00149	0.00149	0.00147
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00149	0.00149	0.00147

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)	-0.00135	-0.00145	-0.00144
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00147	-0.00147	-0.00147
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00164	-0.00165	-0.00166
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00164	-0.00165	-0.00166

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)	0.00144	0.00146	0.00144
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00147	0.00147	0.00148
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00166	0.00168	0.00166
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00166	0.00168	0.00166

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)	-0.00073	-0.00074	-0.00073
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00073	-0.00073	-0.00073
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00173	-0.00175	-0.00175
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00173	-0.00175	-0.00175

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)	0.00084	0.00084	0.00076
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00073	0.00073	0.00073
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00174	0.00175	0.00175
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00174	0.00175	0.00175

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)	-0.00075	-0.00075	-0.00075
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00074	-0.00075	-0.00074
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00156	-0.00157	-0.00156
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00156	-0.00157	-0.00156

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)	0.00085	0.00085	0.00077
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00074	0.00075	0.00074
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00159	0.00158	0.00157
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00159	0.00158	0.00157

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00282	1.10944
sky130_osu_sc_12T_ms__buf_2	0.00282	2.30709
sky130_osu_sc_12T_ms__buf_4	0.00281	4.57752
sky130_osu_sc_12T_ms__buf_6	0.00082	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00282	8.98043
sky130_osu_sc_12T_ms__buf_l	0.00215	0.85936

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.01406	0.01406
sky130_osu_sc_12T_ms__buf_2	0.00000	0.02109	0.02803
sky130_osu_sc_12T_ms__buf_4	0.00000	0.03515	0.05597
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.06327	0.11186
sky130_osu_sc_12T_ms__buf_l	0.00000	0.22869	0.22869

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)**	0.04962	0.54470	6.21352
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.05233	0.46404	6.30293
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.07031	0.44732	6.58598
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.10614	0.47879	6.99190
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.05082	0.56959	6.22537

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)**	0.05572	0.49457	5.34218
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.06561	0.49012	5.69984
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.09358	0.52201	6.09790
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.15004	0.59080	6.55759
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.05681	0.49445	5.21437

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	0.00204	0.00172	0.00614
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00387	0.00367	0.00804
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00805	0.00821	0.01215
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01646	0.01715	0.02103
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00162	0.00155	0.01342

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	0.00538	0.00550	0.01155
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00688	0.00714	0.01299
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01060	0.01119	0.01685
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01826	0.01947	0.02472
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00424	0.00473	0.01858

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
	-0.00049	-0.00049	-0.00047

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
	0.00049	0.00049	0.00047

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00257	0.00257	0.00829	1.19436	1.19274
sky130_osu_sc_12T_ms__dffnr_l	0.00257	0.00257	0.00829	0.85718	0.85828

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.15893	0.34337
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.37357	0.55800

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)	0.32467	1.41128	15.35130
	QN->Q (FR)	0.02736	0.80292	12.81550
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.31827	1.46112	14.58870
	QN->Q (FR)	0.02906	0.79976	11.71080

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)	0.20982	1.31328	16.20250
	QN->Q (RF)	0.01812	0.51917	8.30969
	RN->Q (FF)	0.19524	1.32811	16.32170
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.21092	1.40487	15.76160
	QN->Q (RF)	0.01915	0.52453	7.81959
	RN->Q (FF)	0.19640	1.41991	15.87620

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)	0.18330	0.81152	8.53448
	RN->QN (FR)	0.16864	0.82637	8.65398
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.18117	0.85439	8.37897
	RN->QN (FR)	0.16656	0.86901	8.49037

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)**	0.28175	0.78730	5.87508
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.27475	0.79507	5.68290

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)	-0.06981	-0.17597	0.43949
	setup	CK (F)	0.14533	0.19210	-0.41648
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.07011	-0.17597	0.43965
	setup	CK (F)	0.14584	0.19210	-0.41648

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)	-0.06948	-0.10264	-0.64641
	setup	CK (F)	0.16219	0.19294	0.87407
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.07110	-0.10404	-0.64978
	setup	CK (F)	0.16123	0.19340	0.88181

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)	-0.06981	-0.17597	0.43949
	setup	CK (F)	0.14533	0.19210	-0.41648
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.07011	-0.17597	0.43965
	setup	CK (F)	0.14584	0.19210	-0.41648

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)	-0.06948	-0.10264	-0.64641
	setup	CK (F)	0.16219	0.19294	0.87407
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.07110	-0.10404	-0.64978
	setup	CK (F)	0.16123	0.19340	0.88181

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)	0.12537	0.09060	-1.71176
	removal	CK (F)	-0.07633	-0.05859	1.71989
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.12691	0.08889	-1.71192
	removal	CK (F)	-0.07633	-0.05859	1.71989

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)	0.12537	0.09060	-1.71176
	removal	CK (F)	-0.07633	-0.05859	1.71989
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.12691	0.08889	-1.71192
	removal	CK (F)	-0.07633	-0.05859	1.71989

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 ()	0.12600	0.39551	13.33370
	min_pulse_width	RN ()	0.12301	0.39551	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.12301	0.39551	13.33370
	min_pulse_width	RN ()	0.12001	0.39551	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 ()	0.14397	0.39551	13.33370
	min_pulse_width	CK ()	0.18888	0.39551	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.14696	0.39551	13.33370
	min_pulse_width	CK ()	0.18888	0.39551	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 ()	0.13199	0.39551	13.33370
	min_pulse_width	CK ()	0.11103	0.39551	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.12899	0.39551	13.33370
	min_pulse_width	CK ()	0.10803	0.39551	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	0.01049	0.00938	-0.00446
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00926	0.00336

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	0.01033	0.00949	0.00446
	RN	-0.00073	-0.04583	-0.72665
	RN	0.01362	0.01274	0.00451
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00981	0.00926	0.00994
	RN	-0.00073	-0.03756	-0.52151
	RN	0.01309	0.01251	0.00994

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	0.01033	0.00950	0.00434
	RN	-0.00073	-0.04579	-0.72566
	RN	0.01362	0.01275	0.00443
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00981	0.00927	0.00998
	RN	-0.00073	-0.03759	-0.52218
	RN	0.01309	0.01251	0.00991

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	0.01047	0.00936	-0.00434
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00996	0.00923	0.00327

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)	0.00686	0.00650	0.00919
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00213	0.00186	0.00463
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00165	-0.00164
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)	0.00686	0.00650	0.00919
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00214	0.00186	0.00463
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00165	-0.00164

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)	0.01022	0.00998	0.01276
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00562	0.00543	0.00810
	!CK	0.00000	0.00000	0.00000
	!CK	0.00163	0.00165	0.00165
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)	0.01022	0.00999	0.01276
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00562	0.00543	0.00810
	!CK	0.00000	0.00000	0.00000
	!CK	0.00164	0.00166	0.00165

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)	0.00704	0.00656	0.01354
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00218	0.00188	0.00843
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00705	0.00656	0.01355
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00218	0.00188	0.00844

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)	0.01046	0.01020	0.01763
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00567	0.00556	0.01288
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01046	0.01020	0.01763
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00567	0.00556	0.01288

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)	-0.00019	-0.00065	0.00574
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00760	0.00666	0.01688
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00205	0.00140	0.01451
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00873	0.00781	0.01672
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00014	-0.00060	0.00580
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00019	-0.00065	0.00574
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00760	0.00665	0.01689
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00205	0.00140	0.01451
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00873	0.00781	0.01672
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00014	-0.00060	0.00580

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)	0.00875	0.00858	0.01590
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01108	0.01085	0.02507
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00908	0.00879	0.01600
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00875	0.00858	0.01590
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01108	0.01085	0.02507
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00908	0.00880	0.01600

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00257	0.00257	0.00828	1.20087	1.18835
sky130_osu_sc_12T_ms__dffr_l	0.00257	0.00257	0.00827	0.86668	0.85807

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.15893	0.34341
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.37357	0.55805

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)	0.26203	1.18714	13.09890
	QN->Q (FR)	0.02736	0.80494	12.85700
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.25545	1.23922	12.38670
	QN->Q (FR)	0.02906	0.80298	11.78960

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)	0.26570	1.24752	14.18780
	QN->Q (RF)	0.01811	0.52006	8.33263
	RN->Q (FF)	0.19551	1.33166	16.39950
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.26667	1.34453	13.83490
	QN->Q (RF)	0.01915	0.52643	7.86547
	RN->Q (FF)	0.19667	1.42726	16.03150

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)	0.23916	0.74204	6.41533
	RN->QN (FR)	0.16889	0.82604	8.63103
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.23685	0.78664	6.29102
	RN->QN (FR)	0.16678	0.86950	8.48984

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)**	0.21904	0.55896	3.51604
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.21186	0.56752	3.33076

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)	-0.03773	-0.06487	-0.25762
	setup	CK (R)	0.20045	0.23719	1.12578
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03801	-0.06286	-0.25756
	setup	CK (R)	0.20097	0.23717	1.12196

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)	-0.11023	-0.34417	-4.22986
	setup	CK (R)	0.13753	0.35819	4.30174
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.11243	-0.34348	-4.23355
	setup	CK (R)	0.13753	0.35819	4.30174

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)	-0.03773	-0.06487	-0.25762
	setup	CK (R)	0.20045	0.23719	1.12578
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.03801	-0.06286	-0.25756
	setup	CK (R)	0.20097	0.23717	1.12196

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)	-0.11023	-0.34417	-4.22986
	setup	CK (R)	0.13753	0.35819	4.30174
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.11243	-0.34348	-4.23355
	setup	CK (R)	0.13753	0.35819	4.30174

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)	0.18017	0.20761	1.14512
	removal	CK (R)	-0.02708	-0.03322	-0.05125
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.18102	0.20888	1.13774
	removal	CK (R)	-0.02708	-0.03322	-0.05125

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)	0.18017	0.20761	1.14512
	removal	CK (R)	-0.02708	-0.03322	-0.05125
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.18102	0.20888	1.13774
	removal	CK (R)	-0.02708	-0.03322	-0.05125

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 ()	0.12301	0.39551	13.33370
	min_pulse_width	RN ()	0.12600	0.39551	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.12001	0.39551	13.33370
	min_pulse_width	RN ()	0.12301	0.39551	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 ()	0.11103	0.39551	13.33370
	min_pulse_width	CK ()	0.14097	0.39551	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.10504	0.39551	13.33370
	min_pulse_width	CK ()	0.13798	0.39551	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 ()	0.26375	0.39551	13.33370
	min_pulse_width	CK ()	0.11103	0.39551	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.26674	0.39551	13.33370
	min_pulse_width	CK ()	0.11103	0.39551	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	0.00563	0.00415	0.00000
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00402	-0.00027

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	0.00628	0.00520	0.00000
	RN	-0.00073	-0.04598	-0.73061
	RN	0.01423	0.01336	0.00502
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00576	0.00496	0.00185
	RN	-0.00073	-0.03781	-0.52729
	RN	0.01371	0.01311	0.01049

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	0.00628	0.00520	0.00000
	RN	-0.00073	-0.04569	-0.72299
	RN	0.01423	0.01336	0.00506
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00576	0.00497	0.00199
	RN	-0.00073	-0.03758	-0.52205
	RN	0.01371	0.01312	0.01050

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	0.00561	0.00414	0.00000
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00509	0.00400	-0.00021

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	-0.00126	-0.00146	-0.00146
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00703	0.00667	0.00936
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00273	0.00244	0.00522
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00126	-0.00146	-0.00146
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00703	0.00667	0.00936
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00273	0.00244	0.00522

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	0.00145	0.00147	0.00146
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01005	0.00981	0.01261
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00503	0.00483	0.00752
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00145	0.00147	0.00146
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01005	0.00981	0.01261
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00503	0.00483	0.00752

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)	0.00218	0.00188	0.00844
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00666	0.00618	0.01317
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)	0.00218	0.00188	0.00844
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00667	0.00618	0.01317

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)	0.00566	0.00556	0.01288
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01084	0.01057	0.01800
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)	0.00566	0.00556	0.01288
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01084	0.01058	0.01800

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)	-0.00034	-0.00080	0.00571
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00368	0.00269	0.00923
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00037	-0.00083	0.00569
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00080	0.00571
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00368	0.00269	0.00923
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00037	-0.00082	0.00569

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)	0.00857	0.00840	0.01583
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01714	0.01661	0.02445
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01267	0.01238	0.01951
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01667	0.01635	0.02997
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00898	0.00881	0.01600
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00857	0.00840	0.01584
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01714	0.01661	0.02445
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01267	0.01238	0.01951
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01667	0.01634	0.02997
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00898	0.00881	0.01600

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00253	0.00258	0.00607	0.00840	1.23660	1.25325
sky130_osu_sc_12T_ms__dffsr_l	0.00253	0.00258	0.00607	0.00840	0.84949	0.86169

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.04984	0.06907
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.26448	0.28371

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)	0.28644	1.22330	13.34960
	QN->Q (FR)	0.02554	0.77290	12.42330
	RN->Q (RR)	0.23211	1.18196	13.40060
	SN->Q (FR)	0.21957	1.32423	15.96290
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.28390	1.27247	12.27250
	QN->Q (FR)	0.02899	0.79740	11.64310
	RN->Q (RR)	0.22944	1.22979	12.31250
	SN->Q (FR)	0.21725	1.37248	14.86520

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)	0.30135	1.27947	14.29010
	QN->Q (RF)	0.01798	0.52440	8.45525
	RN->Q (FF)	0.20646	1.34185	16.50850
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.30385	1.37210	13.60170
	QN->Q (RF)	0.01903	0.52234	7.77310
	RN->Q (FF)	0.20900	1.43295	15.80400

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)	0.27473	0.77738	6.54310
	RN->QN (FR)	0.18009	0.83894	8.76162
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.27384	0.82815	6.37670
	RN->QN (FR)	0.17914	0.88893	8.57654

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)	0.24554	0.60724	3.85775
	RN->QN (RF)	0.19188	0.56635	3.90784
	SN->QN (FF)	0.17935	0.70890	6.47340
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.24125	0.61209	3.48470
	RN->QN (RF)	0.18773	0.57204	3.53126
	SN->QN (FF)	0.17516	0.71298	6.08273

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)	-0.04410	-0.07509	-0.33282
	setup	CK (R)	0.21919	0.24532	1.31862
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.04711	-0.07616	-0.33201
	setup	CK (R)	0.21915	0.24589	1.31669

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)	-0.12851	-0.36372	-4.28793
	setup	CK (R)	0.15760	0.37463	4.40755
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12806	-0.36495	-4.29196
	setup	CK (R)	0.15760	0.37463	4.40754

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)	-0.04410	-0.07509	-0.33282
	setup	CK (R)	0.21919	0.24532	1.31862
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.04711	-0.07616	-0.33201
	setup	CK (R)	0.21915	0.24589	1.31669

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)	-0.12851	-0.36372	-4.28793
	setup	CK (R)	0.15760	0.37463	4.40755
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.12806	-0.36495	-4.29196
	setup	CK (R)	0.15760	0.37463	4.40754

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)	0.18117	0.20199	1.25021
	removal	CK (R)	-0.02494	-0.03247	-0.10284
	hold	SN (R)	-0.17197	-0.32507	-1.80814
	setup	SN (R)	0.19783	0.36418	6.38502
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.18141	0.20240	1.24512
	removal	CK (R)	-0.02494	-0.03247	-0.10284
	hold	SN (R)	-0.16550	-0.31744	-1.76338
	setup	SN (R)	0.19423	0.35445	6.19102

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)	0.18117	0.20199	1.25021
	removal	CK (R)	-0.02494	-0.03247	-0.10284
	hold	SN (R)	-0.17546	-0.32507	-1.80814
	hold	SN (R)	-0.17197	-0.32581	-1.81293
	setup	SN (R)	0.19494	0.35985	6.11404
	setup	SN (R)	0.19783	0.36418	6.38502
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.18141	0.20240	1.24512
	removal	CK (R)	-0.02494	-0.03247	-0.10284
	hold	SN (R)	-0.16753	-0.31744	-1.76338
	hold	SN (R)	-0.16550	-0.31972	-1.77518
	setup	SN (R)	0.19423	0.35224	5.93581
	setup	SN (R)	0.18587	0.35445	6.19102

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 ()	0.14097	0.39551	13.33370
	min_pulse_width	RN ()	0.14397	0.39551	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.14097	0.39551	13.33370
	min_pulse_width	RN ()	0.14097	0.39551	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)	0.02920	0.05879	5.70158
	removal	CK (R)	-0.01030	-0.04109	-0.27063
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02905	0.05879	5.61508
	removal	CK (R)	-0.00871	-0.04109	-0.27063

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)	0.02920	0.05879	5.70158
	removal	CK (R)	-0.01030	-0.04109	-0.27063
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.02905	0.05879	5.61508
	removal	CK (R)	-0.00871	-0.04109	-0.27063

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 ()	0.17691	0.39551	13.33370
	min_pulse_width	SN ()	0.18390	0.39776	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.17691	0.39551	13.33370
	min_pulse_width	SN ()	0.17391	0.39551	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 ()	0.12600	0.39551	13.33370
	min_pulse_width	CK ()	0.16193	0.39551	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.12001	0.39551	13.33370
	min_pulse_width	CK ()	0.15894	0.39551	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 ()	0.28171	0.39551	13.33370
	min_pulse_width	CK ()	0.13199	0.39551	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.28171	0.39551	13.33370
	min_pulse_width	CK ()	0.13199	0.39551	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	0.00690	0.00541	-0.00056
	RN	0.01248	0.01115	-0.00430
	SN	-0.00073	-0.04680	-0.75235
	SN	0.01379	0.01238	-0.00426
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00643	0.00533	0.00098
	RN	0.01200	0.01108	0.00475
	SN	-0.00073	-0.03736	-0.51683
	SN	0.01332	0.01232	0.00458

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	0.00724	0.00641	0.00056
	RN	-0.00073	-0.04680	-0.75235
	RN	0.01501	0.01433	0.00889
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00673	0.00599	0.00317
	RN	-0.00073	-0.03736	-0.51683
	RN	0.01449	0.01390	0.01136

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	0.00724	0.00643	0.00043
	RN	-0.00073	-0.04717	-0.76248
	RN	0.01501	0.01433	0.00865
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00673	0.00599	0.00301
	RN	-0.00073	-0.03768	-0.52425
	RN	0.01449	0.01390	0.01123

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	0.00687	0.00538	-0.00043
	RN	0.01246	0.01112	-0.00443
	SN	-0.00073	-0.04717	-0.76246
	SN	0.01377	0.01236	-0.00437
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00640	0.00530	0.00080
	RN	0.01197	0.01104	0.00450
	SN	-0.00073	-0.03768	-0.52424
	SN	0.01329	0.01229	0.00449

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	-0.00143	-0.00148	-0.00147
	(!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)	0.00872	0.00838	0.01101
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00290	0.00263	0.00532
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00289	0.00261	0.00531
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00292	0.00265	0.00534
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00143	-0.00148	-0.00147
	(!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)	0.00872	0.00838	0.01102
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00291	0.00263	0.00532
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00289	0.00261	0.00531
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00292	0.00265	0.00534

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	0.00149	0.00148	0.00147
	(!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)	0.01157	0.01135	0.01386
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00552	0.00535	0.00799
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00555	0.00538	0.00800
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00549	0.00533	0.00797
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00149	0.00148	0.00147
	(!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)	0.01158	0.01135	0.01386
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00552	0.00535	0.00799
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00555	0.00538	0.00801
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00550	0.00533	0.00797

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)	0.00176	0.00145	0.00790
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00784	0.00731	0.01368
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)	0.00176	0.00145	0.00790
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00784	0.00731	0.01368

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)	0.00618	0.00613	0.01351
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01148	0.01119	0.01837
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)	0.00619	0.00613	0.01352
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01148	0.01119	0.01837

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)	-0.00389	-0.00391	-0.00393
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00400	-0.00426	-0.00424
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00379	-0.00391	-0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00173	0.00143	0.00457
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)	-0.00389	-0.00390	-0.00392
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00400	-0.00426	-0.00424
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00379	-0.00391	-0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00173	0.00143	0.00457

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)	0.00393	0.00401	0.00394
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00423	0.00426	0.00424
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00391	0.00393	0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00933	0.00906	0.01144
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)	0.00393	0.00401	0.00394
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00423	0.00426	0.00424
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00391	0.00393	0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00934	0.00906	0.01144

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)	-0.00039	-0.00086	0.00562
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00432	0.00337	0.00990
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00427	0.00331	0.00987
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00027	-0.00073	0.00576
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00199	0.00126	0.01419
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00039	-0.00086	0.00562
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00433	0.00338	0.00988
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00428	0.00332	0.00987
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00027	-0.00073	0.00576
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00199	0.00126	0.01420

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)	0.01907	0.01857	0.02629
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00874	0.00858	0.01597
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01280	0.01253	0.01962
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01283	0.01251	0.01964
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01827	0.01789	0.03125
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00898	0.00880	0.01598
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01163	0.01140	0.02561
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01907	0.01857	0.02629
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00874	0.00857	0.01598
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01280	0.01254	0.01963
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01284	0.01252	0.01964
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01827	0.01788	0.03126
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00899	0.00880	0.01599
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01163	0.01140	0.02563

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00255	0.00511	0.00821	1.19362	1.20468
sky130_osu_sc_12T_ms__dffs_l	0.00255	0.00511	0.00821	0.85817	0.86614

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.33775	0.94286
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.55238	1.15750

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)	0.19073	1.10053	12.89810
	QN->Q (FR)	0.02734	0.80141	12.75830
	SN->Q (FR)	0.15638	1.21837	14.92490
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.18945	1.15874	12.14680
	QN->Q (FR)	0.02901	0.79870	11.64880
	SN->Q (FR)	0.15479	1.27127	14.16550

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)	0.28730	1.26695	14.09020
	QN->Q (RF)	0.01803	0.51686	8.28048
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.28601	1.35799	13.69150
	QN->Q (RF)	0.01908	0.52305	7.80415

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)	0.26007	0.76882	6.51083
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.25565	0.80983	6.36106

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)	0.15328	0.48168	3.47050
	SN->QN (FF)	0.11832	0.59968	5.50400
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.15054	0.49617	3.27390
	SN->QN (FF)	0.11531	0.60919	5.29036

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)	-0.02850	-0.05197	-0.21615
	setup	CK (R)	0.13774	0.17728	1.01352
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02804	-0.05199	-0.21641
	setup	CK (R)	0.13666	0.17746	1.01161

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)	-0.11621	-0.35095	-4.28031
	setup	CK (R)	0.14933	0.36421	4.33991
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11698	-0.34933	-4.28181
	setup	CK (R)	0.14935	0.36421	4.33992

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)	-0.02850	-0.05197	-0.21615
	setup	CK (R)	0.13774	0.17728	1.01352
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.02804	-0.05199	-0.21641
	setup	CK (R)	0.13666	0.17746	1.01161

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)	-0.11621	-0.35095	-4.28031
	setup	CK (R)	0.14933	0.36421	4.33991
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.11698	-0.34933	-4.28181
	setup	CK (R)	0.14935	0.36421	4.33992

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)	0.03260	0.06214	4.43719
	removal	CK (R)	-0.01690	-0.04109	-0.36443
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.03259	0.06216	4.33530
	removal	CK (R)	-0.01690	-0.04109	-0.36443

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)	0.03260	0.06214	4.43719
	removal	CK (R)	-0.01690	-0.04109	-0.36443
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.03259	0.06216	4.33530
	removal	CK (R)	-0.01690	-0.04109	-0.36443

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 ()	0.11103	0.39551	13.33370
	min_pulse_width	SN ()	0.11402	0.39551	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.10803	0.39551	13.33370
	min_pulse_width	SN ()	0.10803	0.39551	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 ()	0.07210	0.39551	13.33370
	min_pulse_width	CK ()	0.14696	0.39551	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.06910	0.39551	13.33370
	min_pulse_width	CK ()	0.14397	0.39551	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 ()	0.20086	0.39551	13.33370
	min_pulse_width	CK ()	0.12600	0.39551	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.20086	0.39551	13.33370
	min_pulse_width	CK ()	0.12600	0.39551	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	0.00563	0.00411	0.00000
	SN	-0.00073	-0.04581	-0.72620
	SN	0.01196	0.01089	0.00573
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00511	0.00403	0.00003
	SN	-0.00073	-0.03759	-0.52211
	SN	0.01144	0.01077	0.01390

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	0.00625	0.00522	0.00000
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00573	0.00499	0.00219

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	0.00625	0.00522	0.00000
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00573	0.00498	0.00209

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	0.00560	0.00411	0.00000
	SN	-0.00073	-0.04607	-0.73291
	SN	0.01193	0.01086	0.00546
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00508	0.00401	-0.00007
	SN	-0.00073	-0.03780	-0.52694
	SN	0.01140	0.01074	0.01344

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	-0.00145	-0.00150	-0.00150
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00694	0.00658	0.00964
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00270	0.00242	0.00517
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00145	-0.00149	-0.00150
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00694	0.00658	0.00964
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00271	0.00242	0.00517

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	0.00152	0.00151	0.00151
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01000	0.00973	0.01241
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00506	0.00488	0.00761
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00153	0.00152	0.00151
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01000	0.00974	0.01242
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00506	0.00488	0.00761

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)	-0.00292	-0.00295	-0.00294
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00183	0.00155	0.01396
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)	-0.00292	-0.00294	-0.00294
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00183	0.00155	0.01394

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)	0.00295	0.00295	0.00294
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00665	0.00672	0.02067
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)	0.00295	0.00295	0.00295
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00665	0.00672	0.02068

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)	-0.00034	-0.00080	0.00571
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00031	-0.00077	0.00576
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00185	0.00113	0.01431
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00034	-0.00080	0.00571
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00031	-0.00076	0.00576
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00185	0.00113	0.01431

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)	0.01713	0.01666	0.02465
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00857	0.00843	0.01584
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01653	0.01611	0.02973
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00893	0.00876	0.01595
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01099	0.01082	0.02519
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01714	0.01666	0.02466
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00858	0.00843	0.01584
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01653	0.01611	0.02973
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00893	0.00876	0.01596
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01099	0.01082	0.02519

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00270	0.00810	1.07580
sky130_osu_sc_12T_ms__dff_l	0.00270	0.00809	0.79945

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.04528	0.05633
sky130_osu_sc_12T_ms__dff_l	0.00000	0.25992	0.27096

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)**	0.16199	0.67068	6.25325
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.16054	0.71262	6.11440

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)**	0.24840	0.56407	3.25985
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.24741	0.58656	3.20105

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)	-0.03021	-0.05180	-0.26964
	setup	CK (R)	0.11034	0.15482	1.01252
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.02752	-0.05180	-0.26960
	setup	CK (R)	0.11043	0.15526	1.00945

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)	-0.10511	-0.34617	-4.28606
	setup	CK (R)	0.13153	0.36127	4.34796
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.10469	-0.34617	-4.28832
	setup	CK (R)	0.13155	0.36127	4.34800

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 ()	0.06611	0.39551	13.33370
	min_pulse_width	CK ()	0.13798	0.39551	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.06311	0.39551	13.33370
	min_pulse_width	CK ()	0.13199	0.39551	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 ()**	0.17092	0.39551	13.33370
	min_pulse_width	**CK ()**	0.10204	0.39551	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.17092	0.39551	13.33370
	min_pulse_width	**CK ()**	0.10204	0.39551	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	0.01178	0.01067	0.02139
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01071	0.00968	0.02039

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	0.01269	0.01187	0.01833
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01166	0.01084	0.01736

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	-0.00125	-0.00145	-0.00145
	!CK	0.00000	0.00000	0.00000
	!CK	0.00611	0.00578	0.00857
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00125	-0.00145	-0.00145
	!CK	0.00000	0.00000	0.00000
	!CK	0.00612	0.00578	0.00857

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	0.00144	0.00146	0.00145
	!CK	0.00000	0.00000	0.00000
	!CK	0.01031	0.01003	0.01276
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00144	0.00146	0.00145
	!CK	0.00000	0.00000	0.00000
	!CK	0.01032	0.01004	0.01276

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)	-0.00037	-0.00083	0.00570
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00032	-0.00076	0.00577
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00037	-0.00083	0.00570
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00031	-0.00076	0.00577

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)	0.00855	0.00843	0.01583
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01631	0.01584	0.02390
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01674	0.01636	0.02995
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00887	0.00870	0.01590
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00855	0.00844	0.01583
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01631	0.01585	0.02391
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01675	0.01637	0.02996
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00887	0.00870	0.01590

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00261	1.07495
sky130_osu_sc_12T_ms__inv_10	0.02308	10.91286
sky130_osu_sc_12T_ms__inv_2	0.00481	2.23372
sky130_osu_sc_12T_ms__inv_3	0.00711	3.26544
sky130_osu_sc_12T_ms__inv_4	0.00936	4.42034
sky130_osu_sc_12T_ms__inv_6	0.01400	6.57839
sky130_osu_sc_12T_ms__inv_8	0.01854	8.72600
sky130_osu_sc_12T_ms__inv_l	0.00212	0.76658

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00703	0.01397
sky130_osu_sc_12T_ms__inv_10	0.00000	0.07029	0.13971
sky130_osu_sc_12T_ms__inv_2	0.00000	0.01406	0.02794
sky130_osu_sc_12T_ms__inv_3	0.00000	0.02109	0.04191
sky130_osu_sc_12T_ms__inv_4	0.00000	0.02812	0.05588
sky130_osu_sc_12T_ms__inv_6	0.00000	0.04218	0.08383
sky130_osu_sc_12T_ms__inv_8	0.00000	0.05624	0.11177
sky130_osu_sc_12T_ms__inv_l	0.00000	0.11435	0.22862

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)**	0.02621	0.73197	11.38700
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.03081	0.48632	11.46720
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.01918	0.62021	11.34350
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.02063	0.57841	11.36690
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.02033	0.54602	11.34640
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02286	0.51428	11.34860
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.02651	0.49551	11.36040
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.02908	0.74226	10.59880

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)**	0.01633	0.44668	6.99001
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.02166	0.28911	7.34587
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01309	0.38952	7.17751
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.01416	0.36490	7.26974
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.01400	0.34217	7.29110
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.01647	0.31597	7.31891
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.01900	0.30021	7.33028
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.01799	0.46550	6.69687

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	0.00266	0.00272	0.00340
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02136	0.02286	0.03016
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00452	0.00469	0.00613
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00696	0.00714	0.00942
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00882	0.00881	0.01215
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01305	0.01410	0.01821
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01722	0.01787	0.02426
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00214	0.00233	0.00513

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	-0.00040	-0.00039	-0.00017
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00750	-0.00712	-0.00363
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00139	-0.00131	-0.00081
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00179	-0.00176	-0.00089
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00285	-0.00278	-0.00154
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00434	-0.00423	-0.00225
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00593	-0.00565	-0.00296
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00032	-0.00000

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.09467	0.09457	0.00539	0.09084

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.01427	0.01463

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)	-	0.01051	0.19898	1.68606
	A1->Y (RR)	-	0.01253	0.20196	1.68898
	S0->Y (RR)	(!A0 * A1)	0.03719	0.18333	0.03999
	S0->Y (FR)	(A0 * !A1)	0.02835	0.33772	2.73343

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)	-	0.01243	0.18422	1.65356
	A1->Y (FF)	-	0.01124	0.18177	1.64905
	S0->Y (FF)	(!A0 * A1)	0.05515	0.31359	2.11479
	S0->Y (RF)	(A0 * !A1)	0.01824	0.18288	0.77648

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	-	-0.00271	-0.00271	-0.00271
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00169	-0.00169	-0.00169
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00367	0.00373	0.01169
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00161	-0.00191	0.00538

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	-	0.00271	0.00271	0.00272
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00169	0.00169	0.00169
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00046	0.00018	0.00774
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00726	0.00728	0.01493

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)	-0.00064	-0.00064	-0.00064

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)	0.00064	0.00064	0.00065

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)	-0.00077	-0.00078	-0.00078

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)	0.00077	0.00078	0.00078

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)	-0.00059	-0.00086	0.00659
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00057	-0.00086	0.00658

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)	0.00561	0.00556	0.01335
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00532	0.00533	0.01328

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00259	0.00259	1.06699
sky130_osu_sc_12T_ms__nand2_l	0.00207	0.00209	0.76305

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00705	0.02794
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.11436	0.45724

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)	0.02731	0.73389	11.38320
	B->Y (FR)	0.03140	0.70359	10.85760
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.02935	0.74238	10.59100
	B->Y (FR)	0.03581	0.74742	10.57310

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)	0.02248	0.53743	8.29447
	B->Y (RF)	0.02613	0.54329	8.27288
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.02493	0.57109	8.09022
	B->Y (RF)	0.02832	0.56877	7.94891

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	0.00281	0.00287	0.00349
	B	0.00000	0.00000	0.00000
	B	0.00365	0.00366	0.00435
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00216	0.00236	0.00485
	B	0.00000	0.00000	0.00000
	B	0.00278	0.00293	0.00547

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	-0.00023	-0.00029	-0.00004
	B	0.00000	0.00000	0.00000
	B	-0.00022	-0.00028	-0.00013
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00015	-0.00019	0.00010
	B	0.00000	0.00000	0.00000
	B	-0.00015	-0.00019	-0.00001

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)	-0.00175	-0.00177	-0.00176
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00126	-0.00127	-0.00128

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)	0.00176	0.00178	0.00177
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00127	0.00129	0.00128

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)	-0.00159	-0.00160	-0.00160
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00117	-0.00118	-0.00117

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)	0.00162	0.00161	0.00160
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00119	0.00118	0.00117

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00256	0.00283	0.57633
sky130_osu_sc_12T_ms__nor2_l	0.00198	0.00220	0.43717

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00518	0.01397
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.07550	0.22862

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)	0.05893	0.89724	11.48490
	B->Y (FR)	0.04762	0.86618	11.27340
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.06088	0.93932	11.11700
	B->Y (FR)	0.05211	0.89459	10.67340

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)	0.02074	0.37202	4.85753
	B->Y (RF)	0.01733	0.36482	4.84486
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.02152	0.39219	4.78276
	B->Y (RF)	0.01882	0.38566	4.77208

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	0.00365	0.00358	0.00378
	B	0.00000	0.00000	0.00000
	B	0.00295	0.00284	0.00346
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00271	0.00266	0.00341
	B	0.00000	0.00000	0.00000
	B	0.00226	0.00241	0.00593

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	0.00040	0.00027	0.00063
	B	0.00000	0.00000	0.00000
	B	-0.00031	-0.00032	0.00002
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00029	0.00021	0.00067
	B	0.00000	0.00000	0.00000
	B	-0.00020	-0.00021	0.00023

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)	-0.00126	-0.00147	-0.00147
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00082	-0.00101	-0.00102

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)	0.00146	0.00148	0.00147
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00102	0.00103	0.00103

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)	-0.00074	-0.00074	-0.00074
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00053	-0.00053	-0.00053

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)	0.00078	0.00078	0.00075
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00055	0.00056	0.00054

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00259	0.00268	0.00234	0.57765

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.08836	0.24259

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)	0.06847	0.88980	11.36330
	A1->Y (FR)	0.08279	0.92602	11.56210
	B0->Y (FR)	0.03602	0.67141	9.04843

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)	0.03160	0.45302	5.82525
	A1->Y (RF)	0.03579	0.45136	5.75678
	B0->Y (RF)	0.02457	0.45992	6.12921

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	0.00413	0.00393	0.00500
	A1	0.00000	0.00000	0.00000
	A1	0.00488	0.00477	0.00494
	B0	0.00323	0.00342	0.00678

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00023	0.00018	0.00036
	A1	0.00000	0.00000	0.00000
	A1	0.00096	0.00082	0.00101
	B0	0.00044	0.00040	0.00075

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)	-0.00074	-0.00074	-0.00074
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00146	-0.00150	-0.00150
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00152	-0.00153	-0.00152

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)	0.00079	0.00079	0.00076
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00149	0.00150	0.00150
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00153	0.00154	0.00153

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)	-0.00120	-0.00140	-0.00141
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00144	-0.00149	-0.00148
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00150	-0.00150	-0.00150

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)	0.00140	0.00142	0.00141
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00147	0.00149	0.00148
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00150	0.00152	0.00151

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)	-0.00134	-0.00135	-0.00137

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)	0.00137	0.00139	0.00137

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00242	0.00255	0.00273	0.00270	0.61173

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00779	0.02794

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)	0.08754	0.92126	11.60330
	A1->Y (FR)	0.07661	0.89150	11.42120
	B0->Y (FR)	0.05014	0.86293	11.40210
	B1->Y (FR)	0.06235	0.89520	11.58480

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)	0.04734	0.48362	6.06608
	A1->Y (RF)	0.03969	0.47271	6.03610
	B0->Y (RF)	0.03288	0.47994	6.34942
	B1->Y (RF)	0.04101	0.49473	6.41725

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	0.00615	0.00606	0.00622
	A1	0.00541	0.00525	0.00626
	B0	0.00386	0.00375	0.00473
	B1	0.00466	0.00455	0.00471

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00139	0.00127	0.00143
	A1	0.00074	0.00068	0.00084
	B0	-0.00007	-0.00006	0.00022
	B1	0.00139	0.00126	0.00155

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)	-0.00123	-0.00143	-0.00143
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00123	-0.00143	-0.00143
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00139	-0.00142	-0.00143
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00145	-0.00145	-0.00145

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)	0.00142	0.00145	0.00143
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00142	0.00143	0.00143
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00142	0.00142	0.00143
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00145	0.00146	0.00145

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)	-0.00072	-0.00072	-0.00072
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00072	-0.00072	-0.00072
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00139	-0.00142	-0.00142
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00144	-0.00145	-0.00145

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)	0.00076	0.00076	0.00073
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00076	0.00076	0.00073
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00141	0.00142	0.00142
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00145	0.00146	0.00145

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)	-0.00073	-0.00073	-0.00073
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00073	-0.00073	-0.00073
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00169	-0.00173	-0.00173
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00170	-0.00171	-0.00174

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)	0.00077	0.00077	0.00074
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00077	0.00077	0.00074
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00173	0.00175	0.00173
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00175	0.00177	0.00175

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)	-0.00122	-0.00142	-0.00142
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00122	-0.00142	-0.00142
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00172	-0.00177	-0.00177
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00173	-0.00176	-0.00178

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)	0.00141	0.00142	0.00142
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00141	0.00142	0.00142
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00178	0.00179	0.00177
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00178	0.00180	0.00179

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00291	0.00267	1.10739
sky130_osu_sc_12T_ms__or2_2	0.00291	0.00267	2.30166
sky130_osu_sc_12T_ms__or2_4	0.00291	0.00267	4.52810
sky130_osu_sc_12T_ms__or2_8	0.00291	0.00268	8.86583
sky130_osu_sc_12T_ms__or2_l	0.00224	0.00209	0.80031

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00874	0.01415
sky130_osu_sc_12T_ms__or2_2	0.00000	0.01230	0.02812
sky130_osu_sc_12T_ms__or2_4	0.00000	0.01942	0.05606
sky130_osu_sc_12T_ms__or2_8	0.00000	0.03365	0.11194
sky130_osu_sc_12T_ms__or2_l	0.00000	0.13271	0.22877

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)	0.05621	0.56842	6.22171
	B->Y (RR)	0.05078	0.54978	6.19547
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.05949	0.48565	6.32947
	B->Y (RR)	0.05379	0.46911	6.29443
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.07769	0.46369	6.58716
	B->Y (RR)	0.07186	0.45101	6.54706
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.11339	0.49219	7.01391
	B->Y (RR)	0.10759	0.48240	6.97862
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.05821	0.60476	5.98197
	B->Y (RR)	0.05340	0.58761	6.08689

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)	0.10588	0.58546	5.72166
	B->Y (FF)	0.08875	0.54698	5.54398
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.12711	0.58729	6.12304
	B->Y (FF)	0.11011	0.55725	5.90150
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.17985	0.63775	6.57292
	B->Y (FF)	0.16294	0.61266	6.31029
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.28586	0.75565	7.11921
	B->Y (FF)	0.26893	0.72794	6.83411
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.10920	0.58264	5.33152
	B->Y (FF)	0.09390	0.54233	5.22828

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	0.00284	0.00243	0.00546
	B	0.00000	0.00000	0.00000
	B	0.00218	0.00204	0.00643
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00469	0.00445	0.00760
	B	0.00000	0.00000	0.00000
	B	0.00399	0.00404	0.00843
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00890	0.00899	0.01199
	B	0.00000	0.00000	0.00000
	B	0.00817	0.00865	0.01283
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01736	0.01798	0.02123
	B	0.00000	0.00000	0.00000
	B	0.01655	0.01773	0.02162
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00222	0.00202	0.00653
	B	0.00000	0.00000	0.00000
	B	0.00174	0.00173	0.01072

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	0.00641	0.00612	0.00841
	B	0.00000	0.00000	0.00000
	B	0.00544	0.00561	0.01189
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00794	0.00785	0.01001
	B	0.00000	0.00000	0.00000
	B	0.00697	0.00730	0.01318
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01169	0.01199	0.01393
	B	0.00000	0.00000	0.00000
	B	0.01069	0.01130	0.01671
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02025	0.02004	0.02219
	B	0.00000	0.00000	0.00000
	B	0.01907	0.01941	0.02438
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00488	0.00471	0.00940
	B	0.00000	0.00000	0.00000
	B	0.00420	0.00462	0.01723

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)	-0.00128	-0.00149	-0.00148
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00148	-0.00148
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00148	-0.00148
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00148	-0.00148
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00082	-0.00102	-0.00102

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)	0.00148	0.00149	0.00148
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00148	0.00150	0.00148
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00148	0.00149	0.00148
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00148	0.00150	0.00148
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00103	0.00103	0.00103

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)	-0.00074	-0.00075	-0.00074
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00074	-0.00075	-0.00074
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00074	-0.00075	-0.00074
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00074	-0.00075	-0.00074
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00052	-0.00052	-0.00052

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)	0.00078	0.00079	0.00076
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00078	0.00079	0.00076
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00078	0.00079	0.00076
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00078	0.00079	0.00076
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00054	0.00055	0.00053

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00280	0.00375	0.60268
sky130_osu_sc_12T_ms__tbufi_l	0.00221	0.00294	0.42431

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00710	0.02794
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.11442	0.45724

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)	0.04333	0.85121	11.29370
	OE->Y (FR)	0.03956	0.27584	4.59462
	OE->Y (RR)	0.06834	0.67559	6.35444
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.04981	0.88164	10.47520
	OE->Y (FR)	0.03951	0.27558	4.59468
	OE->Y (RR)	0.07249	0.73102	6.34758

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)	0.02185	0.43911	5.91062
	OE->Y (FF)	0.04002	0.27587	4.59455
	OE->Y (RF)	0.02210	0.44180	5.88900
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.02454	0.46243	5.66833
	OE->Y (FF)	0.04013	0.27557	4.59461
	OE->Y (RF)	0.02426	0.45621	5.55522

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	0.00271	0.00261	0.00360
	OE	0.00000	0.00000	0.00000
	OE	0.00257	0.00233	0.00894
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00211	0.00223	0.00548
	OE	0.00000	0.00000	0.00000
	OE	0.00192	0.00193	0.01597

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	-0.00032	-0.00029	-0.00002
	OE	0.00000	0.00000	0.00000
	OE	0.00163	0.00139	0.00912
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00019	-0.00020	0.00020
	OE	0.00000	0.00000	0.00000
	OE	0.00117	0.00118	0.01673

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)	-0.00129	-0.00131	-0.00130
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00118	-0.00119	-0.00118
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00095	-0.00095	-0.00095
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00087	-0.00087	-0.00087

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)	0.00129	0.00131	0.00130
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00121	0.00122	0.00119
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00095	0.00095	0.00095
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00089	0.00089	0.00088

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)	0.00093	0.00071	0.00857
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00084	0.00060	0.00848
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00068	0.00074	0.01650
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00058	0.00063	0.01640

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)	0.00328	0.00328	0.01128
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00333	0.00337	0.01134
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00257	0.00296	0.01893
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00257	0.00301	0.01897

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00280	0.00403	0.60962
sky130_osu_sc_12T_ms__tnbufi_l	0.00211	0.00314	0.43124

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.01173	0.01407
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.19060	0.22872

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)	0.04367	0.85502	11.37240
	OE->Y (RR)	0.02097	0.27565	4.59483
	OE->Y (FR)	0.05251	0.88483	11.55730
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.04887	0.88651	10.57800
	OE->Y (RR)	0.02269	0.27545	4.59460
	OE->Y (FR)	0.05583	0.92954	11.01910

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)	0.02131	0.44051	5.95165
	OE->Y (RF)	0.02075	0.27565	4.59484
	OE->Y (FF)	0.04760	0.45590	4.48809
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.02324	0.46417	5.72482
	OE->Y (RF)	0.02246	0.27544	4.59466
	OE->Y (FF)	0.05140	0.45386	4.18893

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	0.00282	0.00272	0.00373
	OE	0.00000	0.00000	0.00000
	OE	0.00670	0.00681	0.01522
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00216	0.00228	0.00551
	OE	0.00000	0.00000	0.00000
	OE	0.00521	0.00579	0.02195

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	-0.00046	-0.00042	-0.00015
	OE	0.00000	0.00000	0.00000
	OE	0.00587	0.00616	0.01345
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00035	-0.00035	0.00005
	OE	0.00000	0.00000	0.00000
	OE	0.00458	0.00522	0.02019

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)	-0.00105	-0.00106	-0.00105
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00094	-0.00095	-0.00094
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00073	-0.00074	-0.00073
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00065	-0.00067	-0.00066

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)	0.00105	0.00106	0.00105
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00097	0.00097	0.00095
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00073	0.00074	0.00073
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00067	0.00068	0.00067

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)	-0.00159	-0.00202	0.00606
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00158	-0.00198	0.00609
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00107	-0.00119	0.01464
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00112	-0.00120	0.01466

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)	0.00505	0.00526	0.01360
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00498	0.00533	0.01355
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00399	0.00463	0.02072
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00394	0.00455	0.02068

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00560	0.00472	0.63510

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.02421	0.04200

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	0.08817	0.71745	6.66566
	A->Y (FR)	!B	0.05863	0.87850	11.53090
	B->Y (RR)	A	0.07239	0.69990	6.64648
	B->Y (FR)	!A	0.07238	0.90607	11.70760

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	0.07290	0.51309	4.75862
	A->Y (RF)	!B	0.03048	0.45734	6.08058
	B->Y (FF)	A	0.06667	0.50662	4.75726
	B->Y (RF)	!A	0.03488	0.46404	6.08429

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	0.00281	0.00245	0.00896
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00696	0.00692	0.01587
	B	A	0.00000	0.00000	0.00000
	B	A	0.00141	0.00127	0.00886
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00722	0.00720	0.01535

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	0.00819	0.00800	0.01568
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00192	0.00160	0.00925
	B	A	0.00000	0.00000	0.00000
	B	A	0.00743	0.00752	0.01550
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00252	0.00218	0.00985

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.00563	0.00476	0.58911

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.02421	0.04022

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	0.09625	0.72666	6.60097
	A->Y (FR)	B	0.07453	0.91790	11.66570
	B->Y (RR)	!A	0.07750	0.71793	6.60027
	B->Y (FR)	A	0.08212	0.92633	11.66410

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	0.07560	0.51237	4.55730
	A->Y (RF)	B	0.02914	0.45095	5.84139
	B->Y (FF)	!A	0.06944	0.50238	4.56275
	B->Y (RF)	A	0.03436	0.45364	5.82313

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	0.00805	0.00799	0.01604
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00193	0.00114	0.00838
	B	A	0.00000	0.00000	0.00000
	B	A	0.00814	0.00813	0.01610
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00136	0.00115	0.00867

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	0.00159	0.00116	0.00881
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00865	0.00867	0.01566
	B	A	0.00000	0.00000	0.00000
	B	A	0.00161	0.00121	0.00871
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00752	0.00767	0.01549

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

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	0.31667
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	128383.00000	256766.00000
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
	-0.00116	0.02400	0.39471

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
	2.23502	2.13468	0.49305