sky130_osu_sc_12T_ms_ss_1P44_-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_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.01026	0.01034	0.00808	0.38046	0.15590	0.35322
sky130_osu_sc_12T_ms__addf_l	0.01027	0.01034	0.00809	0.29383	0.15646	0.35315

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.00038	0.00042
sky130_osu_sc_12T_ms__addf_l	0.00000	0.00037	0.00042

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)	0.36637	2.57331	23.32160
	B->CO (RR)	0.35361	2.51355	22.96520
	CI->CO (RR)	0.34989	2.57335	23.59830
	CON->CO (FR)	0.07856	1.24392	13.34580
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.34872	2.40256	20.22750
	B->CO (RR)	0.33725	2.35467	20.06190
	CI->CO (RR)	0.33236	2.40214	20.52580
	CON->CO (FR)	0.08319	1.27157	12.77290

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)	0.82286	4.59976	39.39560
	B->CO (FF)	0.76035	4.45120	38.44330
	CI->CO (FF)	0.75339	4.49261	39.07360
	CON->CO (RF)	0.03720	0.70537	8.18982
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.80826	4.30028	33.74520
	B->CO (FF)	0.74762	4.16983	32.98350
	CI->CO (FF)	0.73879	4.19204	33.41620
	CON->CO (RF)	0.04500	0.79017	8.64714

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)	0.56818	2.03195	13.70680
	B->CON (FR)	0.51387	1.94090	13.43840
	CI->CON (FR)	0.49868	1.92414	13.40760
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.54208	2.00737	13.70560
	B->CON (FR)	0.48867	1.91713	13.43720
	CI->CON (FR)	0.47264	1.89950	13.40630

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)	0.17457	0.84330	7.11963
	B->CON (RF)	0.16749	0.83890	7.32351
	CI->CON (RF)	0.15808	0.84476	7.44674
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.16773	0.83718	7.12057
	B->CON (RF)	0.16094	0.83306	7.32450
	CI->CON (RF)	0.15123	0.83858	7.44776

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)	1.11706	4.79017	35.28200
	B->S (-R)	1.09138	4.71471	34.77850
	CI->S (-R)	1.04278	4.67771	34.92840
	CON->S (RR)	0.21208	1.32804	10.33210
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	1.06976	4.75298	35.24540
	B->S (-R)	1.04627	4.67738	34.75360
	CI->S (-R)	0.99519	4.64008	34.89020
	CON->S (RR)	0.21226	1.32808	10.33030

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)	0.71921	2.42123	16.55820
	B->S (-F)	0.72318	2.33276	16.32710
	CI->S (-F)	0.70157	2.41310	16.83720
	CON->S (FF)	0.33028	1.11441	7.92065
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.70358	2.40795	16.54660
	B->S (-F)	0.70822	2.32061	16.31860
	CI->S (-F)	0.68610	2.39995	16.82500
	CON->S (FF)	0.33033	1.11436	7.92050

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	0.00172	0.00168	0.00164
	B	0.00195	0.00199	0.00196
	CI	0.00207	0.00211	0.00208
sky130_osu_sc_12T_ms__addf_l	A	0.00154	0.00150	0.00145
	B	0.00177	0.00180	0.00176
	CI	0.00190	0.00192	0.00189

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00557	0.00557	0.00552
	B	0.00549	0.00551	0.00546
	CI	0.00480	0.00491	0.00486
sky130_osu_sc_12T_ms__addf_l	A	0.00542	0.00541	0.00537
	B	0.00534	0.00535	0.00530
	CI	0.00465	0.00475	0.00470

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00556	0.00555	0.00550
	B	0.00550	0.00548	0.00542
	CI	0.00480	0.00488	0.00483
sky130_osu_sc_12T_ms__addf_l	A	0.00542	0.00540	0.00535
	B	0.00535	0.00533	0.00527
	CI	0.00465	0.00473	0.00468

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00171	0.00167	0.00159
	B	0.00194	0.00197	0.00187
	CI	0.00207	0.00210	0.00204
sky130_osu_sc_12T_ms__addf_l	A	0.00153	0.00149	0.00140
	B	0.00176	0.00178	0.00168
	CI	0.00189	0.00192	0.00186

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00557	0.00557	0.00553
	B	0.00550	0.00551	0.00547
	CI	0.00480	0.00491	0.00486
sky130_osu_sc_12T_ms__addf_l	A	0.00542	0.00542	0.00538
	B	0.00535	0.00536	0.00532
	CI	0.00465	0.00476	0.00471

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01116	0.01117	0.01114
	B	0.01045	0.01031	0.01015
	CI	0.00913	0.00911	0.00905
sky130_osu_sc_12T_ms__addf_l	A	0.01118	0.01118	0.01114
	B	0.01046	0.01031	0.01015
	CI	0.00913	0.00911	0.00905

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00502	0.00531	0.37027	0.37534	0.37336
sky130_osu_sc_12T_ms__addh_l	0.00501	0.00531	0.29056	0.37934	0.29150

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.00035	0.00041
sky130_osu_sc_12T_ms__addh_l	0.00000	0.00033	0.00038

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)	0.26528	1.35803	10.28810
	B->CO (RR)	0.26929	1.34994	10.43330
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.24926	1.37716	9.92641
	B->CO (RR)	0.25346	1.37018	10.09100

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)	0.27088	1.02774	8.05882
	B->CO (FF)	0.28099	1.04150	8.12550
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.26705	1.10185	8.49139
	B->CO (FF)	0.27702	1.11570	8.56521

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)	0.38104	1.44645	10.30080
	B->CON (RR)	0.38479	1.43655	10.46480
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.35390	1.42157	10.30140
	B->CON (RR)	0.35775	1.41238	10.45600

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)	0.32433	1.06234	8.10046
	B->CON (FF)	0.32776	1.07106	8.16930
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.29750	1.03143	7.98144
	B->CON (FF)	0.30133	1.04014	8.04806

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)	0.46932	2.21251	18.16330
	B->S (FR)	0.47337	2.22127	18.23940
	CON->S (FR)	0.08032	1.23872	13.29200
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.43702	2.12432	16.41920
	B->S (FR)	0.44106	2.13251	16.48880
	CON->S (FR)	0.08298	1.26673	12.72350

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)	0.52186	2.48421	19.23440
	B->S (RF)	0.52559	2.47282	19.37710
	CON->S (RF)	0.03659	0.70372	8.15801
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.50088	2.37519	16.96600
	B->S (RF)	0.50455	2.36839	17.13530
	CON->S (RF)	0.04407	0.78943	8.64369

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	0.00281	0.00272	0.00262
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00258	0.00248
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00247	0.00236	0.00226
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00221	0.00211

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	0.00394	0.00386	0.00369
	B	0.00000	0.00000	0.00000
	B	0.00410	0.00412	0.00398
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00359	0.00349	0.00336
	B	0.00000	0.00000	0.00000
	B	0.00376	0.00376	0.00368

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	0.00281	0.00273	0.00262
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00257	0.00248
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00247	0.00236	0.00226
	B	0.00000	0.00000	0.00000
	B	0.00231	0.00221	0.00212

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	0.00394	0.00386	0.00370
	B	0.00000	0.00000	0.00000
	B	0.00411	0.00412	0.00398
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00359	0.00349	0.00332
	B	0.00000	0.00000	0.00000
	B	0.00376	0.00375	0.00361

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	0.00394	0.00386	0.00378
	B	0.00000	0.00000	0.00000
	B	0.00411	0.00413	0.00408
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00359	0.00350	0.00331
	B	0.00000	0.00000	0.00000
	B	0.00376	0.00376	0.00360

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	0.00281	0.00272	0.00262
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00257	0.00248
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00247	0.00236	0.00228
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00220	0.00213

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.22412	0.21111	0.04433
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.22414	0.21113	0.04435

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.22400	0.21046	0.04100
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.22402	0.21047	0.04103

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00279	0.37114
sky130_osu_sc_12T_ms__and2_2	0.00270	0.00279	0.75132
sky130_osu_sc_12T_ms__and2_4	0.00270	0.00279	1.47170
sky130_osu_sc_12T_ms__and2_6	0.00273	0.00278	2.17693
sky130_osu_sc_12T_ms__and2_8	0.00270	0.00279	2.86608
sky130_osu_sc_12T_ms__and2_l	0.00204	0.00210	0.29325

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.00015	0.00020
sky130_osu_sc_12T_ms__and2_2	0.00000	0.00022	0.00024
sky130_osu_sc_12T_ms__and2_4	0.00000	0.00036	0.00038
sky130_osu_sc_12T_ms__and2_6	0.00000	0.00050	0.00054
sky130_osu_sc_12T_ms__and2_8	0.00000	0.00064	0.00070
sky130_osu_sc_12T_ms__and2_l	0.00000	0.00011	0.00015

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)	0.20200	1.26707	9.86675
	B->Y (RR)	0.21046	1.26862	10.09020
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.22566	1.15178	10.26230
	B->Y (RR)	0.23383	1.14857	10.42380
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.31147	1.14564	10.76750
	B->Y (RR)	0.31980	1.13835	10.85890
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.40006	1.19730	11.12130
	B->Y (RR)	0.40800	1.19161	11.16590
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.48459	1.26828	11.45040
	B->Y (RR)	0.49291	1.26392	11.44710
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.20678	1.32356	9.78212
	B->Y (RR)	0.21546	1.32569	9.98909

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)	0.20372	0.92790	7.50207
	B->Y (FF)	0.21305	0.94197	7.60195
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.25212	0.94009	7.89175
	B->Y (FF)	0.26018	0.94933	7.96029
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.37109	1.04559	8.44760
	B->Y (FF)	0.37419	1.04899	8.48675
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.49305	1.17242	8.84978
	B->Y (FF)	0.49121	1.17113	8.86967
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.60869	1.29731	9.14632
	B->Y (FF)	0.60250	1.28606	9.16048
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.19544	0.97498	7.42992
	B->Y (FF)	0.20903	0.99240	7.52215

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	0.00203	0.00184	0.00174
	B	0.00000	0.00000	0.00000
	B	0.00207	0.00189	0.00178
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00372	0.00366	0.00358
	B	0.00000	0.00000	0.00000
	B	0.00375	0.00372	0.00366
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00759	0.00768	0.00789
	B	0.00000	0.00000	0.00000
	B	0.00763	0.00782	0.00796
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01148	0.01185	0.01207
	B	0.00000	0.00000	0.00000
	B	0.01151	0.01193	0.01216
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01530	0.01593	0.01835
	B	0.00000	0.00000	0.00000
	B	0.01535	0.01603	0.01627
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00156	0.00144	0.00136
	B	0.00000	0.00000	0.00000
	B	0.00159	0.00146	0.00139

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	0.00493	0.00480	0.00473
	B	0.00000	0.00000	0.00000
	B	0.00551	0.00538	0.00530
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00615	0.00626	0.00619
	B	0.00000	0.00000	0.00000
	B	0.00674	0.00682	0.00675
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00920	0.00979	0.00978
	B	0.00000	0.00000	0.00000
	B	0.00981	0.01033	0.01030
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01237	0.01337	0.01350
	B	0.00000	0.00000	0.00000
	B	0.01297	0.01389	0.01397
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01533	0.01671	0.01702
	B	0.00000	0.00000	0.00000
	B	0.01594	0.01719	0.01748
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00370	0.00358	0.00354
	B	0.00000	0.00000	0.00000
	B	0.00409	0.00398	0.00393

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)	-0.00161	-0.00163	-0.00163
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00161	-0.00163	-0.00163
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00162	-0.00163	-0.00163
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00164	-0.00164	-0.00165
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00162	-0.00162	-0.00163
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00113	-0.00113	-0.00114

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)	0.00164	0.00164	0.00164
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00163	0.00163	0.00164
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00167	0.00164
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00165	0.00168	0.00166
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00164	0.00167	0.00164
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00114	0.00114	0.00114

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)	-0.00154	-0.00155	-0.00154
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00154	-0.00155	-0.00155
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00154	-0.00155	-0.00155
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00154	-0.00155	-0.00155
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00154	-0.00155	-0.00155
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00108	-0.00108	-0.00108

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)	0.00154	0.00155	0.00155
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00155	0.00155
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00156	0.00155
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00156	0.00155
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00155	0.00156	0.00155
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00108	0.00109	0.00109

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00240	0.00261	0.00259	0.15736

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00008	0.00010

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)	0.28203	1.78556	13.69220
	A1->Y (FR)	0.23531	1.67114	13.23160
	B0->Y (FR)	0.23328	1.69377	13.42960

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)	0.08469	0.74590	6.99756
	A1->Y (RF)	0.07871	0.75126	7.24588
	B0->Y (RF)	0.05295	0.68865	7.07672

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	0.00372	0.00367	0.00366
	A1	0.00000	0.00000	0.00000
	A1	0.00319	0.00312	0.00309
	B0	0.00323	0.00316	0.00311

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	0.00055	0.00046	0.00039
	A1	0.00000	0.00000	0.00000
	A1	0.00055	0.00046	0.00038
	B0	-0.00030	-0.00029	-0.00036

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)	-0.00127	-0.00131	-0.00130
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00133	-0.00134	-0.00133
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00133	-0.00134	-0.00133

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)	0.00129	0.00131	0.00130
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00133	0.00135	0.00134
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00133	0.00135	0.00134

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)	-0.00127	-0.00131	-0.00130
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00133	-0.00133	-0.00134
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00146	-0.00148	-0.00148

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)	0.00130	0.00131	0.00130
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00133	0.00135	0.00134
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00149	0.00149	0.00149

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)	-0.00080	-0.00080	-0.00080

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)	0.00087	0.00088	0.00082

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00240	0.00260	0.00276	0.00256	0.15332

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.00012	0.00016

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)	0.35672	1.85453	13.60560
	A1->Y (FR)	0.31986	1.80799	13.53090
	B0->Y (FR)	0.24756	1.68821	13.24780
	B1->Y (FR)	0.28479	1.72958	13.32640

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)	0.10547	0.76429	6.96288
	A1->Y (RF)	0.09935	0.76971	7.21029
	B0->Y (RF)	0.06779	0.73219	7.15842
	B1->Y (RF)	0.07410	0.72615	6.91331

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	0.00457	0.00451	0.00448
	A1	0.00404	0.00396	0.00392
	B0	0.00346	0.00337	0.00330
	B1	0.00400	0.00392	0.00387

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00120	0.00113	0.00104
	A1	0.00121	0.00113	0.00102
	B0	-0.00016	-0.00017	-0.00023
	B1	-0.00017	-0.00017	-0.00022

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)	-0.00127	-0.00131	-0.00129
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00133	-0.00134	-0.00133
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00133	-0.00134	-0.00133
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00133	-0.00134	-0.00133

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)	0.00129	0.00132	0.00129
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00133	0.00135	0.00134
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00133	0.00134	0.00134
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00133	0.00134	0.00134

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)	-0.00127	-0.00131	-0.00130
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00133	-0.00134	-0.00134
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00146	-0.00148	-0.00148
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00146	-0.00148	-0.00148

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)	0.00129	0.00131	0.00130
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00133	0.00135	0.00134
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00147	0.00148	0.00148
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00147	0.00148	0.00148

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)	-0.00080	-0.00080	-0.00080
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00079	-0.00080	-0.00079
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00153	-0.00154	-0.00155
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00153	-0.00155	-0.00155

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)	0.00089	0.00089	0.00082
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00079	0.00080	0.00079
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00155	0.00156	0.00155
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00155	0.00156	0.00155

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)	-0.00080	-0.00081	-0.00081
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00080	-0.00081	-0.00080
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00141	-0.00142	-0.00141
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00141	-0.00142	-0.00141

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)	0.00091	0.00091	0.00083
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00080	0.00081	0.00080
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00141	0.00143	0.00142
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00141	0.00143	0.00142

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00281	0.35780
sky130_osu_sc_12T_ms__buf_2	0.00281	0.73869
sky130_osu_sc_12T_ms__buf_4	0.00281	1.44909
sky130_osu_sc_12T_ms__buf_6	0.00084	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00281	2.88985
sky130_osu_sc_12T_ms__buf_l	0.00208	0.28969

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00012	0.00012
sky130_osu_sc_12T_ms__buf_2	0.00000	0.00018	0.00020
sky130_osu_sc_12T_ms__buf_4	0.00000	0.00030	0.00036
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.00055	0.00068
sky130_osu_sc_12T_ms__buf_l	0.00000	0.00010	0.00010

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)**	0.14520	1.22097	9.80778
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.14576	1.07335	10.12280
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.19249	1.02170	10.47910
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.28963	1.05727	11.13900
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.14940	1.25496	9.56853

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)**	0.19469	0.91018	7.35625
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.24276	0.92698	7.80185
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.36220	1.03269	8.37354
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.59976	1.28767	9.14916
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.19089	0.96614	7.36897

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	0.00197	0.00171	0.00159
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00364	0.00352	0.00339
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00754	0.00767	0.00768
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01528	0.01571	0.01611
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00153	0.00135	0.00127

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	0.00488	0.00469	0.00463
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00607	0.00609	0.00602
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00915	0.00961	0.00957
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01531	0.01652	0.01674
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00371	0.00357	0.00352

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
	-0.00041	-0.00041	-0.00041

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
	0.00041	0.00041	0.00041

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00253	0.00257	0.00837	0.37006	0.37245
sky130_osu_sc_12T_ms__dffnr_l	0.00253	0.00257	0.00837	0.28957	0.29414

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.00060	0.00071
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.00058	0.00069

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)	1.24119	3.02219	18.59330
	QN->Q (FR)	0.08591	1.30979	13.90660
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	1.21414	3.13178	18.84170
	QN->Q (FR)	0.08692	1.31345	13.11360

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)	0.79390	2.80610	21.27410
	QN->Q (RF)	0.04047	0.74222	8.54353
	RN->Q (FF)	0.67326	2.73657	21.46550
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.79102	3.00962	21.73340
	QN->Q (RF)	0.04713	0.81302	8.91002
	RN->Q (FF)	0.67003	2.94342	21.91880

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)	0.68392	1.81283	12.49360
	RN->QN (FR)	0.56238	1.74217	12.69100
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.66524	1.83823	12.26760
	RN->QN (FR)	0.54321	1.76808	12.45870

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)**	1.08915	1.89720	8.77213
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	1.06267	1.93462	9.22655

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)	-0.18633	-0.51504	-5.44099
	setup	CK (F)	0.48315	0.55998	5.51408
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18565	-0.51674	-5.43634
	setup	CK (F)	0.48636	0.55831	5.51546

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)	-0.29880	-0.33224	-1.59056
	setup	CK (F)	0.58220	0.57367	1.88292
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.29816	-0.33080	-1.59105
	setup	CK (F)	0.58280	0.57388	1.88578

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)	-0.18633	-0.51504	-5.44099
	setup	CK (F)	0.48315	0.55998	5.51408
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18565	-0.51674	-5.43634
	setup	CK (F)	0.48636	0.55831	5.51546

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)	-0.29880	-0.33224	-1.59056
	setup	CK (F)	0.58220	0.57367	1.88292
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.29816	-0.33080	-1.59105
	setup	CK (F)	0.58280	0.57388	1.88578

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)	0.41129	0.38903	-0.42002
	removal	CK (F)	-0.20982	-0.16163	0.54271
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.41626	0.39176	-0.42284
	removal	CK (F)	-0.20982	-0.16163	0.54359

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)	0.41129	0.38903	-0.42002
	removal	CK (F)	-0.20982	-0.16163	0.54271
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.41626	0.39176	-0.42284
	removal	CK (F)	-0.20982	-0.16163	0.54359

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 ()	0.43759	0.76180	13.33370
	min_pulse_width	RN ()	0.43882	0.76399	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.42362	0.75743	13.33370
	min_pulse_width	RN ()	0.42362	0.75743	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 ()	0.48819	0.52780	13.33370
	min_pulse_width	CK ()	0.64085	0.60653	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.49215	0.52780	13.33370
	min_pulse_width	CK ()	0.64083	0.60434	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 ()	0.49135	0.74649	13.33370
	min_pulse_width	CK ()	0.43074	0.80991	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.47862	0.74430	13.33370
	min_pulse_width	CK ()	0.42234	0.80554	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	0.00920	0.00904	0.00709
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00868	0.00855	0.00737

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	0.00918	0.00892	0.00784
	RN	-0.00069	-0.02018	-0.19184
	RN	0.01171	0.01156	0.01037
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00865	0.00840	0.00771
	RN	-0.00069	-0.01742	-0.15011
	RN	0.01118	0.01103	0.01019

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	0.00918	0.00893	0.00786
	RN	-0.00069	-0.02026	-0.19308
	RN	0.01172	0.01156	0.01035
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00865	0.00840	0.00770
	RN	-0.00069	-0.01759	-0.15248
	RN	0.01118	0.01103	0.01018

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	0.00919	0.00903	0.00693
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00867	0.00853	0.00727

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)	0.00553	0.00534	0.00518
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00173	0.00157	0.00144
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00148	-0.00148
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)	0.00553	0.00534	0.00518
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00173	0.00157	0.00144
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00148	-0.00148

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)	0.00861	0.00851	0.00835
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00456	0.00444	0.00439
	!CK	0.00000	0.00000	0.00000
	!CK	0.00147	0.00149	0.00148
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)	0.00861	0.00851	0.00835
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00456	0.00444	0.00439
	!CK	0.00000	0.00000	0.00000
	!CK	0.00147	0.00149	0.00148

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)	0.00596	0.00563	0.00540
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00192	0.00172	0.00158
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00596	0.00563	0.00540
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00192	0.00172	0.00158

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)	0.00900	0.00876	0.00851
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00475	0.00457	0.00452
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00900	0.00876	0.00851
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00475	0.00457	0.00452

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00022	-0.00049	-0.00070
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00633	0.00566	0.00522
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00191	0.00138	0.00106
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00721	0.00672	0.00635
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00014	-0.00046	-0.00065
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00022	-0.00049	-0.00071
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00633	0.00565	0.00521
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00191	0.00139	0.00106
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00721	0.00672	0.00635
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00014	-0.00046	-0.00065

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)	0.00788	0.00759	0.00744
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00983	0.00938	0.00921
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00811	0.00782	0.00771
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00788	0.00759	0.00744
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00983	0.00938	0.00921
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00811	0.00781	0.00771

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00253	0.00257	0.00842	0.37476	0.37189
sky130_osu_sc_12T_ms__dffr_l	0.00253	0.00257	0.00842	0.28945	0.29338

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.00060	0.00072
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.00058	0.00069

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)	0.99162	2.66535	16.13010
	QN->Q (FR)	0.08591	1.31622	14.00140
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.96434	2.76536	16.19490
	QN->Q (FR)	0.08692	1.31313	13.10720

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)	0.95796	2.93425	19.80240
	QN->Q (RF)	0.04046	0.74444	8.57862
	RN->Q (FF)	0.67428	2.75142	21.67080
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.95548	3.12972	20.06890
	QN->Q (RF)	0.04712	0.81293	8.90876
	RN->Q (FF)	0.67140	2.94491	21.91490

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)	0.84770	1.93144	10.82390
	RN->QN (FR)	0.56326	1.74366	12.68340
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.82960	1.95604	10.59970
	RN->QN (FR)	0.54470	1.76782	12.44480

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)**	0.83953	1.53029	6.15267
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.81287	1.56721	6.60041

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)	-0.12490	-0.14647	-0.86655
	setup	CK (R)	0.73620	0.72315	1.58876
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12661	-0.14635	-0.86804
	setup	CK (R)	0.73808	0.72543	1.59012

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)	-0.42788	-0.82064	-9.88160
	setup	CK (R)	0.49618	0.86340	9.97456
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.42757	-0.81814	-9.88084
	setup	CK (R)	0.49634	0.86340	9.97453

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)	-0.12490	-0.14647	-0.86655
	setup	CK (R)	0.73620	0.72315	1.58876
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12661	-0.14635	-0.86804
	setup	CK (R)	0.73808	0.72543	1.59012

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)	-0.42788	-0.82064	-9.88160
	setup	CK (R)	0.49618	0.86340	9.97456
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.42757	-0.81814	-9.88084
	setup	CK (R)	0.49634	0.86340	9.97453

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)	0.66822	0.66400	1.26866
	removal	CK (R)	-0.08255	-0.10106	-0.02920
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.67138	0.66441	1.27443
	removal	CK (R)	-0.08255	-0.10106	-0.02920

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)	0.66822	0.66400	1.26866
	removal	CK (R)	-0.08255	-0.10106	-0.02920
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.67138	0.66441	1.27443
	removal	CK (R)	-0.08255	-0.10106	-0.02920

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 ()	0.44172	0.76399	13.33370
	min_pulse_width	RN ()	0.43882	0.76399	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.42650	0.75743	13.33370
	min_pulse_width	RN ()	0.42650	0.75743	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 ()	0.39416	0.54311	13.33370
	min_pulse_width	CK ()	0.54528	0.54092	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.36327	0.53655	13.33370
	min_pulse_width	CK ()	0.53064	0.53873	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 ()	0.99075	1.02204	13.33370
	min_pulse_width	CK ()	0.41718	0.75086	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.99287	1.02423	13.33370
	min_pulse_width	CK ()	0.41718	0.75086	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	0.00482	0.00445	0.00243
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00430	0.00395	0.00275

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	0.00542	0.00517	0.00410
	RN	-0.00069	-0.02034	-0.19427
	RN	0.01214	0.01198	0.01076
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00488	0.00465	0.00395
	RN	-0.00069	-0.01742	-0.15005
	RN	0.01160	0.01146	0.01061

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	0.00542	0.00517	0.00412
	RN	-0.00069	-0.02024	-0.19279
	RN	0.01214	0.01198	0.01077
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00488	0.00465	0.00395
	RN	-0.00069	-0.01756	-0.15209
	RN	0.01160	0.01146	0.01060

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	0.00481	0.00444	0.00218
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00429	0.00394	0.00258

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	-0.00127	-0.00132	-0.00131
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00557	0.00538	0.00521
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00213	0.00197	0.00184
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00127	-0.00132	-0.00131
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00557	0.00538	0.00521
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00213	0.00197	0.00184

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	0.00131	0.00133	0.00131
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00857	0.00846	0.00832
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00415	0.00404	0.00400
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00131	0.00133	0.00131
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00857	0.00846	0.00832
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00415	0.00404	0.00400

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)	0.00192	0.00171	0.00158
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00563	0.00531	0.00508
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)	0.00192	0.00172	0.00158
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00563	0.00531	0.00508

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)	0.00475	0.00456	0.00451
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00933	0.00908	0.00883
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)	0.00475	0.00456	0.00451
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00933	0.00908	0.00883

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)	-0.00032	-0.00061	-0.00081
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00278	0.00237	0.00195
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00032	-0.00063	-0.00083
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00032	-0.00061	-0.00081
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00278	0.00237	0.00195
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00032	-0.00063	-0.00083

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)	0.00778	0.00749	0.00734
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01477	0.01439	0.01391
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01115	0.01092	0.01059
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01479	0.01430	0.01397
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00808	0.00778	0.00768
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00778	0.00749	0.00734
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01477	0.01439	0.01391
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01115	0.01092	0.01059
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01479	0.01430	0.01397
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00808	0.00778	0.00768

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00249	0.00258	0.00602	0.00854	0.37795	0.37995
sky130_osu_sc_12T_ms__dffsr_l	0.00249	0.00258	0.00603	0.00854	0.28958	0.29195

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.00065	0.00076
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.00062	0.00074

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)	1.06046	2.73304	16.30490
	QN->Q (FR)	0.08233	1.28195	13.71990
	RN->Q (RR)	0.87805	2.56460	16.29820
	SN->Q (FR)	0.85322	2.61596	18.78380
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	1.04644	2.85767	16.46270
	QN->Q (FR)	0.08674	1.31264	13.10460
	RN->Q (RR)	0.86283	2.68848	16.44310
	SN->Q (FR)	0.83999	2.74246	18.89330

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)	1.08348	3.05726	19.82300
	QN->Q (RF)	0.04015	0.74528	8.60112
	RN->Q (FF)	0.72035	2.78017	21.67260
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	1.08121	3.26589	20.21500
	QN->Q (RF)	0.04689	0.81235	8.90683
	RN->Q (FF)	0.72153	2.99456	22.04980

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)	0.97139	2.06021	10.95790
	RN->QN (FR)	0.61043	1.78492	12.80860
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.95214	2.08800	10.70120
	RN->QN (FR)	0.59444	1.81603	12.54450

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)	0.91590	1.61583	6.43544
	RN->QN (RF)	0.73295	1.45267	6.42411
	SN->QN (FF)	0.70740	1.50380	8.89784
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.89967	1.66127	6.82893
	RN->QN (RF)	0.71670	1.49819	6.81690
	SN->QN (FF)	0.68965	1.54607	9.26072

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)	-0.15835	-0.17317	-0.99752
	setup	CK (R)	0.77945	0.76231	1.54173
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15834	-0.17197	-0.99989
	setup	CK (R)	0.78083	0.76281	1.54505

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)	-0.49273	-0.87223	-10.11580
	setup	CK (R)	0.57739	0.90999	10.16660
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.49374	-0.87072	-10.11510
	setup	CK (R)	0.57710	0.90999	10.16660

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)	-0.15835	-0.17317	-0.99752
	setup	CK (R)	0.77945	0.76231	1.54173
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15834	-0.17197	-0.99989
	setup	CK (R)	0.78083	0.76281	1.54505

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)	-0.49273	-0.87223	-10.11580
	setup	CK (R)	0.57739	0.90999	10.16660
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.49374	-0.87072	-10.11510
	setup	CK (R)	0.57710	0.90999	10.16660

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)	0.66288	0.65289	1.26166
	removal	CK (R)	-0.07799	-0.09307	-0.10444
	hold	SN (R)	-0.70214	-0.98382	-8.47273
	setup	SN (R)	0.72845	1.03825	9.58742
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.66299	0.65809	1.26121
	removal	CK (R)	-0.07669	-0.09199	-0.10767
	hold	SN (R)	-0.66592	-0.95004	-8.36597
	setup	SN (R)	0.72313	1.01138	9.52453

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)	0.66288	0.65289	1.26166
	removal	CK (R)	-0.07799	-0.09307	-0.10444
	hold	SN (R)	-0.70651	-0.98382	-8.47273
	hold	SN (R)	-0.70214	-0.98520	-8.47736
	setup	SN (R)	0.72845	1.03291	9.57423
	setup	SN (R)	0.72291	1.03825	9.58742
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.66299	0.65809	1.26121
	removal	CK (R)	-0.07669	-0.09199	-0.10767
	hold	SN (R)	-0.68530	-0.95590	-8.36597
	hold	SN (R)	-0.66592	-0.95004	-8.37930
	setup	SN (R)	0.72313	1.00459	9.48827
	setup	SN (R)	0.68876	1.01138	9.52453

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 ()	0.49194	0.79898	13.33370
	min_pulse_width	RN ()	0.49802	0.79898	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.48194	0.79241	13.33370
	min_pulse_width	RN ()	0.48797	0.79241	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)	0.07908	0.09470	0.75975
	removal	CK (R)	-0.01929	-0.04779	-0.56927
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.07919	0.09465	0.74892
	removal	CK (R)	-0.01929	-0.04779	-0.56738

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)	0.07908	0.09470	0.75975
	removal	CK (R)	-0.01929	-0.04779	-0.56927
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.07919	0.09465	0.74892
	removal	CK (R)	-0.01929	-0.04779	-0.56738

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 ()	0.68789	1.03735	13.33370
	min_pulse_width	SN ()	0.69981	1.03735	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.68082	1.00892	13.33370
	min_pulse_width	SN ()	0.66435	1.01329	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 ()	0.45230	0.57591	13.33370
	min_pulse_width	CK ()	0.57360	0.55842	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.43220	0.56935	13.33370
	min_pulse_width	CK ()	0.56490	0.55404	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 ()	1.03488	1.05922	13.33370
	min_pulse_width	CK ()	0.50410	0.79898	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	1.03498	1.06140	13.33370
	min_pulse_width	CK ()	0.50410	0.79898	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	0.00577	0.00544	0.00337
	RN	0.01086	0.01060	0.00860
	SN	-0.00069	-0.02044	-0.19593
	SN	0.01176	0.01153	0.00958
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00528	0.00497	0.00377
	RN	0.01036	0.01013	0.00896
	SN	-0.00069	-0.01742	-0.15012
	SN	0.01126	0.01107	0.00991

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	0.00614	0.00595	0.00515
	RN	-0.00069	-0.02044	-0.19593
	RN	0.01286	0.01273	0.01179
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00562	0.00542	0.00473
	RN	-0.00069	-0.01742	-0.15012
	RN	0.01233	0.01218	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	0.00614	0.00596	0.00515
	RN	-0.00069	-0.02051	-0.19697
	RN	0.01286	0.01273	0.01175
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00563	0.00542	0.00473
	RN	-0.00069	-0.01751	-0.15135
	RN	0.01234	0.01218	0.01134

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	0.00575	0.00542	0.00328
	RN	0.01084	0.01058	0.00846
	SN	-0.00069	-0.02051	-0.19695
	SN	0.01174	0.01152	0.00940
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00527	0.00495	0.00362
	RN	0.01035	0.01011	0.00886
	SN	-0.00069	-0.01751	-0.15134
	SN	0.01125	0.01106	0.00981

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	-0.00129	-0.00133	-0.00133
	(!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)	0.00691	0.00675	0.00658
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00234	0.00219	0.00206
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00232	0.00218	0.00204
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00236	0.00221	0.00207
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00129	-0.00133	-0.00133
	(!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)	0.00691	0.00675	0.00658
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00234	0.00219	0.00206
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00232	0.00218	0.00204
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00236	0.00221	0.00207

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	0.00132	0.00134	0.00133
	(!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)	0.00975	0.00966	0.00946
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00464	0.00453	0.00449
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00466	0.00457	0.00451
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00462	0.00453	0.00447
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00132	0.00134	0.00133
	(!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)	0.00975	0.00966	0.00946
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00464	0.00453	0.00449
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00466	0.00457	0.00451
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00462	0.00453	0.00447

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)	0.00182	0.00161	0.00142
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00675	0.00641	0.00610
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)	0.00182	0.00161	0.00142
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00675	0.00641	0.00610

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)	0.00528	0.00509	0.00504
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00998	0.00972	0.00945
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)	0.00528	0.00509	0.00504
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00998	0.00972	0.00945

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)	-0.00343	-0.00347	-0.00347
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00371	-0.00378	-0.00376
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00346	-0.00350	-0.00349
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00130	0.00113	0.00088
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)	-0.00343	-0.00347	-0.00347
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00371	-0.00378	-0.00376
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00346	-0.00350	-0.00349
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00130	0.00113	0.00088

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)	0.00347	0.00349	0.00348
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00375	0.00379	0.00376
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00347	0.00351	0.00349
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00785	0.00767	0.00764
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)	0.00347	0.00349	0.00348
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00375	0.00379	0.00376
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00347	0.00351	0.00349
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00785	0.00767	0.00764

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)	-0.00036	-0.00066	-0.00086
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00339	0.00301	0.00259
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00335	0.00298	0.00256
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00023	-0.00054	-0.00074
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00191	0.00143	0.00107
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00036	-0.00066	-0.00086
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00339	0.00301	0.00260
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00335	0.00298	0.00256
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00023	-0.00054	-0.00074
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00191	0.00143	0.00107

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)	0.01629	0.01593	0.01543
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00792	0.00760	0.00748
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01134	0.01109	0.01078
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01135	0.01113	0.01079
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01602	0.01551	0.01508
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00808	0.00778	0.00768
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01043	0.00990	0.00974
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01629	0.01593	0.01543
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00792	0.00760	0.00748
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01134	0.01109	0.01078
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01135	0.01113	0.01079
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01602	0.01551	0.01508
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00808	0.00778	0.00768
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01043	0.00990	0.00974

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00251	0.00497	0.00832	0.36446	0.37173
sky130_osu_sc_12T_ms__dffs_l	0.00251	0.00497	0.00832	0.28642	0.29318

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.00056	0.00063
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.00053	0.00060

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)	0.63521	2.24477	15.41900
	QN->Q (FR)	0.08604	1.30055	13.76830
	SN->Q (FR)	0.51452	2.20791	17.31670
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.62973	2.38815	15.72670
	QN->Q (FR)	0.08693	1.30576	13.01330
	SN->Q (FR)	0.50848	2.35151	17.61580

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)	1.06219	3.01921	19.46000
	QN->Q (RF)	0.04026	0.73745	8.48795
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	1.04724	3.21350	19.98100
	QN->Q (RF)	0.04696	0.80915	8.86525

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)	0.94756	2.03764	10.91860
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.91757	2.04912	10.68140

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)	0.50627	1.14856	5.79781
	SN->QN (FF)	0.38266	1.11472	7.68889
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.49884	1.21154	6.28008
	SN->QN (FF)	0.37489	1.17656	8.13342

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)	-0.10251	-0.12442	-0.79003
	setup	CK (R)	0.43392	0.41851	1.31903
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10419	-0.12393	-0.79130
	setup	CK (R)	0.43389	0.41853	1.32233

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)	-0.44554	-0.83357	-9.95768
	setup	CK (R)	0.56241	0.88473	10.04830
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.44688	-0.83276	-9.95715
	setup	CK (R)	0.56351	0.88473	10.04860

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)	-0.10251	-0.12442	-0.79003
	setup	CK (R)	0.43392	0.41851	1.31903
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10419	-0.12393	-0.79130
	setup	CK (R)	0.43389	0.41853	1.32233

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)	-0.44554	-0.83357	-9.95768
	setup	CK (R)	0.56241	0.88473	10.04830
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.44688	-0.83276	-9.95715
	setup	CK (R)	0.56351	0.88473	10.04860

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)	0.11276	0.13528	1.01112
	removal	CK (R)	-0.04096	-0.07732	-0.76969
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.11645	0.13667	0.99876
	removal	CK (R)	-0.03926	-0.07733	-0.76926

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)	0.11276	0.13528	1.01112
	removal	CK (R)	-0.04096	-0.07732	-0.76969
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.11645	0.13667	0.99876
	removal	CK (R)	-0.03926	-0.07733	-0.76926

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 ()	0.35913	0.80116	13.33370
	min_pulse_width	SN ()	0.36330	0.79679	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.35060	0.78148	13.33370
	min_pulse_width	SN ()	0.34261	0.78367	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 ()	0.21626	0.52124	13.33370
	min_pulse_width	CK ()	0.56707	0.55404	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.20844	0.52124	13.33370
	min_pulse_width	CK ()	0.55183	0.54748	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 ()	0.68548	0.75743	13.33370
	min_pulse_width	CK ()	0.49230	0.77055	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.68638	0.75524	13.33370
	min_pulse_width	CK ()	0.49523	0.77055	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	0.00481	0.00443	0.00244
	SN	-0.00069	-0.02000	-0.18894
	SN	0.01018	0.00989	0.00788
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00428	0.00393	0.00229
	SN	-0.00069	-0.01731	-0.14848
	SN	0.00965	0.00940	0.00819

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	0.00539	0.00517	0.00417
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00487	0.00465	0.00398

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	0.00540	0.00517	0.00415
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00487	0.00465	0.00396

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	0.00480	0.00441	0.00221
	SN	-0.00069	-0.02024	-0.19269
	SN	0.01017	0.00988	0.00777
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00427	0.00391	0.00264
	SN	-0.00069	-0.01755	-0.15198
	SN	0.00963	0.00938	0.00807

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	-0.00131	-0.00135	-0.00135
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00549	0.00530	0.00508
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00212	0.00197	0.00183
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00131	-0.00135	-0.00135
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00549	0.00530	0.00508
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00212	0.00197	0.00183

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	0.00134	0.00136	0.00135
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00862	0.00851	0.00836
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00424	0.00412	0.00409
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00134	0.00136	0.00135
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00862	0.00851	0.00836
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00424	0.00412	0.00409

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)	-0.00253	-0.00254	-0.00254
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00169	0.00151	0.00137
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)	-0.00253	-0.00254	-0.00254
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00169	0.00151	0.00137

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)	0.00255	0.00256	0.00255
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00557	0.00536	0.00527
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)	0.00255	0.00256	0.00255
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00557	0.00536	0.00527

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)	-0.00032	-0.00061	-0.00081
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00027	-0.00058	-0.00078
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00176	0.00124	0.00090
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00032	-0.00061	-0.00081
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00027	-0.00058	-0.00078
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00176	0.00124	0.00090

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)	0.01475	0.01436	0.01388
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00779	0.00749	0.00735
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01477	0.01420	0.01387
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00804	0.00774	0.00763
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00988	0.00937	0.00920
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01475	0.01436	0.01388
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00779	0.00749	0.00735
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01477	0.01420	0.01387
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00803	0.00774	0.00763
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00988	0.00937	0.00920

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00267	0.00825	0.34977
sky130_osu_sc_12T_ms__dff_l	0.00267	0.00824	0.27986

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.00054	0.00056
sky130_osu_sc_12T_ms__dff_l	0.00000	0.00051	0.00054

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)	0.56647	1.64286	10.27530
sky130_osu_sc_12T_ms__dff_l	CK->Q (RR)	0.55753	1.67519	10.07200

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)	0.88858	1.51587	6.24237
sky130_osu_sc_12T_ms__dff_l	CK->Q (RF)	0.87792	1.58198	6.73834

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)	-0.11571	-0.13686	-0.90062
	setup	CK (R)	0.37105	0.35516	1.31735
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.11256	-0.13753	-0.89967
	setup	CK (R)	0.37144	0.35648	1.31952

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)	-0.42744	-0.83212	-9.98543
	setup	CK (R)	0.50421	0.88717	10.12670
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.42499	-0.83369	-9.98400
	setup	CK (R)	0.50424	0.88725	10.12670

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 ()	0.21254	0.53217	13.33370
	min_pulse_width	CK ()	0.51438	0.53655	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.20854	0.53217	13.33370
	min_pulse_width	CK ()	0.50226	0.53436	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 ()**	0.62011	0.73774	13.33370
	min_pulse_width	**CK ()**	0.41615	0.77055	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.62291	0.73774	13.33370
	min_pulse_width	**CK ()**	0.41615	0.77055	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	0.01018	0.00957	0.00900
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00910	0.00848	0.00794

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	0.01108	0.01069	0.01031
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01004	0.00962	0.00924

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	-0.00126	-0.00131	-0.00130
	!CK	0.00000	0.00000	0.00000
	!CK	0.00512	0.00492	0.00469
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00126	-0.00131	-0.00130
	!CK	0.00000	0.00000	0.00000
	!CK	0.00512	0.00492	0.00469

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	0.00130	0.00132	0.00130
	!CK	0.00000	0.00000	0.00000
	!CK	0.00903	0.00888	0.00871
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00130	0.00132	0.00130
	!CK	0.00000	0.00000	0.00000
	!CK	0.00903	0.00888	0.00871

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)	-0.00034	-0.00063	-0.00083
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00027	-0.00058	-0.00077
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00034	-0.00063	-0.00083
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00027	-0.00058	-0.00077

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)	0.00776	0.00747	0.00733
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01433	0.01397	0.01349
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01506	0.01449	0.01414
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00799	0.00769	0.00758
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00776	0.00747	0.00733
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01433	0.01397	0.01349
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01506	0.01449	0.01414
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00799	0.00769	0.00758

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.35804
sky130_osu_sc_12T_ms__inv_10	0.02309	3.59372
sky130_osu_sc_12T_ms__inv_2	0.00481	0.73003
sky130_osu_sc_12T_ms__inv_3	0.00711	1.07972
sky130_osu_sc_12T_ms__inv_4	0.00936	1.45301
sky130_osu_sc_12T_ms__inv_6	0.01400	2.17161
sky130_osu_sc_12T_ms__inv_8	0.01854	2.89169
sky130_osu_sc_12T_ms__inv_l	0.00204	0.27649

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00006	0.00008
sky130_osu_sc_12T_ms__inv_10	0.00000	0.00061	0.00080
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00012	0.00016
sky130_osu_sc_12T_ms__inv_3	0.00000	0.00018	0.00024
sky130_osu_sc_12T_ms__inv_4	0.00000	0.00024	0.00032
sky130_osu_sc_12T_ms__inv_6	0.00000	0.00036	0.00048
sky130_osu_sc_12T_ms__inv_8	0.00000	0.00049	0.00064
sky130_osu_sc_12T_ms__inv_l	0.00000	0.00005	0.00006

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)**	0.08446	1.26233	13.36230
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.07057	0.81501	13.34730
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.05837	1.06343	13.28990
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.05974	0.98807	13.31360
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.05557	0.93051	13.29780
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.05785	0.87087	13.30540
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.06319	0.83529	13.32680
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.08793	1.27271	12.58940

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)**	0.03712	0.69549	8.02442
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.04147	0.53779	8.17747
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02893	0.63179	8.08062
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.03040	0.60872	8.14704
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02927	0.58586	8.14865
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.03262	0.56022	8.17113
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03670	0.54845	8.18503
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.04537	0.77580	8.46362

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	0.00247	0.00231	0.00242
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02028	0.02012	0.02080
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00424	0.00419	0.00422
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00653	0.00643	0.00652
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00830	0.00818	0.00835
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01233	0.01221	0.01260
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01632	0.01594	0.01656
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00193	0.00189	0.00172

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	-0.00035	-0.00039	-0.00041
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.00638	-0.00649	-0.00603
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00121	-0.00125	-0.00127
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00153	-0.00162	-0.00160
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00243	-0.00253	-0.00246
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00369	-0.00384	-0.00366
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00500	-0.00511	-0.00484
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00025	-0.00028	-0.00029

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.21079	0.21173	0.00538	0.33094

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00020	0.00024

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)	-	0.04215	0.79945	9.07646
	A1->Y (RR)	-	0.05192	0.80531	9.08811
	S0->Y (RR)	(!A0 * A1)	0.11264	0.95578	8.63866
	S0->Y (FR)	(A0 * !A1)	0.08605	1.08773	10.11510

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)	-	0.03645	0.63959	7.47351
	A1->Y (FF)	-	0.03009	0.63330	7.45846
	S0->Y (FF)	(!A0 * A1)	0.19626	0.87144	7.20118
	S0->Y (RF)	(A0 * !A1)	0.03980	0.68113	7.39700

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	-	-0.00236	-0.00236	-0.00237
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00158	-0.00158	-0.00158
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00347	0.00325	0.00319
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00144	-0.00172	-0.00185

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	-	0.00236	0.00236	0.00237
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00158	0.00158	0.00158
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00047	0.00019	0.00006
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00648	0.00624	0.00619

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)	-0.00063	-0.00062	-0.00062

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)	0.00063	0.00062	0.00062

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)	-0.00075	-0.00075	-0.00075

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)	0.00075	0.00075	0.00075

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)	-0.00050	-0.00078	-0.00091
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00049	-0.00077	-0.00089

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)	0.00508	0.00485	0.00479
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00487	0.00464	0.00458

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00257	0.35840
sky130_osu_sc_12T_ms__nand2_l	0.00199	0.00201	0.28148

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00008	0.00016
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.00006	0.00011

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)	0.08860	1.26938	13.39970
	B->Y (FR)	0.10020	1.25116	13.07830
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.08867	1.28295	12.70950
	B->Y (FR)	0.10204	1.29682	12.71340

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)	0.06443	0.92725	9.96044
	B->Y (RF)	0.07125	0.92416	9.74205
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.07514	1.05636	10.61050
	B->Y (RF)	0.08196	1.05617	10.43240

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	0.00260	0.00244	0.00256
	B	0.00000	0.00000	0.00000
	B	0.00316	0.00309	0.00310
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00193	0.00190	0.00134
	B	0.00000	0.00000	0.00000
	B	0.00231	0.00227	0.00178

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	-0.00021	-0.00026	-0.00028
	B	0.00000	0.00000	0.00000
	B	-0.00020	-0.00024	-0.00025
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00013	-0.00016	-0.00017
	B	0.00000	0.00000	0.00000
	B	-0.00013	-0.00016	-0.00017

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)	-0.00155	-0.00156	-0.00157
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00109	-0.00109	-0.00110

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)	0.00156	0.00157	0.00157
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00109	0.00110	0.00110

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)	-0.00144	-0.00144	-0.00144
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00102	-0.00103	-0.00103

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)	0.00144	0.00147	0.00145
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00103	0.00104	0.00103

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00253	0.00283	0.16694
sky130_osu_sc_12T_ms__nor2_l	0.00190	0.00212	0.13242

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00007	0.00008
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.00006	0.00008

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)	0.21395	1.68191	13.62520
	B->Y (FR)	0.18867	1.61646	13.34220
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.21052	1.72075	13.23250
	B->Y (FR)	0.19170	1.64298	12.68270

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)	0.04362	0.60790	6.32817
	B->Y (RF)	0.03895	0.60085	6.31217
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.05147	0.66407	6.70890
	B->Y (RF)	0.04666	0.65789	6.69508

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	0.00313	0.00307	0.00305
	B	0.00000	0.00000	0.00000
	B	0.00271	0.00262	0.00258
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00227	0.00222	0.00221
	B	0.00000	0.00000	0.00000
	B	0.00202	0.00195	0.00192

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	0.00019	0.00010	0.00004
	B	0.00000	0.00000	0.00000
	B	-0.00030	-0.00031	-0.00037
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00016	0.00010	0.00007
	B	0.00000	0.00000	0.00000
	B	-0.00019	-0.00019	-0.00024

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)	-0.00128	-0.00132	-0.00132
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00086	-0.00089	-0.00089

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)	0.00131	0.00132	0.00132
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00089	0.00089	0.00089

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)	-0.00080	-0.00082	-0.00080
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00055	-0.00056	-0.00055

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)	0.00083	0.00083	0.00081
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00057	0.00057	0.00055

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00257	0.00264	0.00229	0.16487

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.00008	0.00014

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)	0.25553	1.68128	13.33760
	A1->Y (FR)	0.29114	1.75774	13.63060
	B0->Y (FR)	0.11170	1.08287	9.92068

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)	0.08369	0.76270	7.15637
	A1->Y (RF)	0.09425	0.76321	7.12057
	B0->Y (RF)	0.06974	0.76240	7.48371

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	0.00351	0.00342	0.00338
	A1	0.00000	0.00000	0.00000
	A1	0.00400	0.00392	0.00389
	B0	0.00275	0.00267	0.00264

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	0.00019	0.00018	0.00013
	A1	0.00000	0.00000	0.00000
	A1	0.00072	0.00063	0.00057
	B0	0.00099	0.00094	0.00089

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)	-0.00081	-0.00082	-0.00081
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00131	-0.00133	-0.00134
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00138	-0.00139	-0.00138

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)	0.00083	0.00083	0.00081
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00133	0.00133	0.00134
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00138	0.00139	0.00138

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)	-0.00123	-0.00128	-0.00127
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00129	-0.00134	-0.00133
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00136	-0.00137	-0.00136

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)	0.00127	0.00128	0.00127
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00133	0.00134	0.00133
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00136	0.00137	0.00136

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)	-0.00114	-0.00115	-0.00118

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)	0.00118	0.00119	0.00118

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00238	0.00253	0.00273	0.00267	0.17049

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00012	0.00016

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)	0.31277	1.77937	13.72860
	A1->Y (FR)	0.28292	1.70900	13.44650
	B0->Y (FR)	0.19685	1.61627	13.34850
	B1->Y (FR)	0.23103	1.68950	13.63360

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)	0.11711	0.81166	7.30513
	A1->Y (RF)	0.10053	0.79148	7.27077
	B0->Y (RF)	0.08692	0.79119	7.59771
	B1->Y (RF)	0.10470	0.81137	7.64302

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	0.00491	0.00484	0.00482
	A1	0.00442	0.00433	0.00428
	B0	0.00332	0.00325	0.00319
	B1	0.00385	0.00378	0.00375

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00095	0.00087	0.00081
	A1	0.00047	0.00047	0.00039
	B0	0.00046	0.00045	0.00037
	B1	0.00096	0.00086	0.00079

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)	-0.00125	-0.00129	-0.00129
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00125	-0.00129	-0.00129
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00125	-0.00129	-0.00129
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00132	-0.00132	-0.00132

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)	0.00128	0.00130	0.00129
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00128	0.00130	0.00129
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00128	0.00130	0.00129
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00132	0.00133	0.00132

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)	-0.00078	-0.00080	-0.00079
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00078	-0.00080	-0.00079
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00124	-0.00128	-0.00128
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00131	-0.00132	-0.00131

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)	0.00081	0.00082	0.00079
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00081	0.00081	0.00079
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00127	0.00128	0.00128
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00131	0.00132	0.00132

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)	-0.00079	-0.00079	-0.00079
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00079	-0.00080	-0.00079
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00148	-0.00152	-0.00151
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00149	-0.00150	-0.00155

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)	0.00082	0.00082	0.00080
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00082	0.00082	0.00080
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00151	0.00153	0.00151
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00155	0.00156	0.00155

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)	-0.00124	-0.00128	-0.00128
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00124	-0.00129	-0.00128
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00152	-0.00156	-0.00155
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00153	-0.00153	-0.00158

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)	0.00127	0.00128	0.00128
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00127	0.00129	0.00128
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00155	0.00156	0.00155
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00158	0.00162	0.00159

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00286	0.00267	0.35605
sky130_osu_sc_12T_ms__or2_2	0.00287	0.00267	0.73332
sky130_osu_sc_12T_ms__or2_4	0.00287	0.00267	1.44849
sky130_osu_sc_12T_ms__or2_8	0.00287	0.00267	2.85679
sky130_osu_sc_12T_ms__or2_l	0.00215	0.00202	0.28046

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00013	0.00016
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00018	0.00024
sky130_osu_sc_12T_ms__or2_4	0.00000	0.00028	0.00040
sky130_osu_sc_12T_ms__or2_8	0.00000	0.00048	0.00072
sky130_osu_sc_12T_ms__or2_l	0.00000	0.00011	0.00014

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)	0.15730	1.24642	9.96293
	B->Y (RR)	0.14750	1.22539	9.80458
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.15945	1.09535	10.20860
	B->Y (RR)	0.14884	1.07795	10.10270
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.20633	1.04094	10.58200
	B->Y (RR)	0.19543	1.02643	10.51120
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.30307	1.07159	11.16040
	B->Y (RR)	0.29199	1.06087	11.10590
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.16451	1.29808	9.77734
	B->Y (RR)	0.15385	1.27628	9.63133

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)	0.42275	1.16585	8.11368
	B->Y (FF)	0.37468	1.08377	7.64303
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.53495	1.26218	8.56234
	B->Y (FF)	0.48711	1.18185	8.16548
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.78741	1.52943	9.20575
	B->Y (FF)	0.74002	1.44381	8.90568
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	1.29234	2.08391	10.12610
	B->Y (FF)	1.24435	1.99372	9.90843
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.41135	1.21160	8.20204
	B->Y (FF)	0.36902	1.12417	7.53102

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	0.00253	0.00232	0.00245
	B	0.00000	0.00000	0.00000
	B	0.00202	0.00186	0.00171
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00423	0.00415	0.00398
	B	0.00000	0.00000	0.00000
	B	0.00371	0.00371	0.00355
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00815	0.00829	0.00824
	B	0.00000	0.00000	0.00000
	B	0.00762	0.00789	0.00789
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01592	0.01635	0.01667
	B	0.00000	0.00000	0.00000
	B	0.01538	0.01598	0.01642
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00194	0.00180	0.00169
	B	0.00000	0.00000	0.00000
	B	0.00158	0.00146	0.00137

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	0.00555	0.00543	0.00539
	B	0.00000	0.00000	0.00000
	B	0.00487	0.00480	0.00474
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00676	0.00687	0.00683
	B	0.00000	0.00000	0.00000
	B	0.00607	0.00623	0.00619
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00977	0.01030	0.01038
	B	0.00000	0.00000	0.00000
	B	0.00909	0.00963	0.00971
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01580	0.01689	0.01752
	B	0.00000	0.00000	0.00000
	B	0.01511	0.01621	0.01680
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00411	0.00403	0.00399
	B	0.00000	0.00000	0.00000
	B	0.00363	0.00359	0.00354

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)	-0.00129	-0.00134	-0.00133
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00130	-0.00134	-0.00133
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00129	-0.00134	-0.00133
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00129	-0.00134	-0.00133
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00087	-0.00090	-0.00090

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)	0.00133	0.00134	0.00133
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00133	0.00134	0.00133
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00133	0.00134	0.00133
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00133	0.00134	0.00133
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00089	0.00090	0.00090

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)	-0.00081	-0.00081	-0.00081
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00081	-0.00081	-0.00081
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00081	-0.00081	-0.00081
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00081	-0.00081	-0.00081
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00054	-0.00054	-0.00054

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)	0.00083	0.00084	0.00081
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00083	0.00084	0.00081
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00083	0.00085	0.00081
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00084	0.00085	0.00081
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00056	0.00057	0.00054

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00364	0.17098
sky130_osu_sc_12T_ms__tbufi_l	0.00213	0.00275	0.13310

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00009	0.00016
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.00008	0.00011

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)	0.17404	1.59718	13.35010
	OE->Y (FR)	0.12565	0.57340	4.56776
	OE->Y (RR)	0.23097	1.57040	10.08480
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.18285	1.63988	12.71500
	OE->Y (FR)	0.11520	0.52984	4.28362
	OE->Y (RR)	0.23902	1.65557	9.99185

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)	0.06244	0.74670	7.43114
	OE->Y (FF)	0.12710	0.57332	4.57016
	OE->Y (RF)	0.05967	0.73147	7.16960
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.07387	0.83012	7.78433
	OE->Y (FF)	0.11625	0.53091	4.28361
	OE->Y (RF)	0.06922	0.81529	7.55348

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	0.00250	0.00242	0.00237
	OE	0.00000	0.00000	0.00000
	OE	0.00222	0.00195	0.00185
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00187	0.00181	0.00177
	OE	0.00000	0.00000	0.00000
	OE	0.00164	0.00144	0.00136

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	-0.00030	-0.00031	-0.00037
	OE	0.00000	0.00000	0.00000
	OE	0.00156	0.00128	0.00118
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00018	-0.00018	-0.00023
	OE	0.00000	0.00000	0.00000
	OE	0.00109	0.00089	0.00081

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)	-0.00124	-0.00124	-0.00124
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00117	-0.00118	-0.00117
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00088	-0.00090	-0.00088
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00083	-0.00083	-0.00083

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)	0.00124	0.00124	0.00124
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00119	0.00120	0.00118
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00088	0.00090	0.00088
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00085	0.00086	0.00084

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)	0.00086	0.00059	0.00049
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00077	0.00050	0.00039
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00061	0.00041	0.00033
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00053	0.00032	0.00025

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)	0.00295	0.00270	0.00265
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00306	0.00280	0.00272
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00222	0.00204	0.00200
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00231	0.00212	0.00206

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00279	0.00409	0.17055
sky130_osu_sc_12T_ms__tnbufi_l	0.00203	0.00308	0.13308

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00010	0.00012
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.00008	0.00010

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)	0.17552	1.59515	13.33110
	OE->Y (RR)	0.04453	0.34297	4.28328
	OE->Y (FR)	0.18639	1.64815	13.60640
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.17935	1.63901	12.70870
	OE->Y (RR)	0.05159	0.36759	4.28300
	OE->Y (FR)	0.18939	1.70525	13.25460

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)	0.06082	0.74558	7.42399
	OE->Y (RF)	0.04389	0.34192	4.28328
	OE->Y (FF)	0.15634	0.90673	6.75350
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.06973	0.82615	7.78120
	OE->Y (RF)	0.05138	0.36464	4.28300
	OE->Y (FF)	0.16593	0.95618	6.52967

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	0.00260	0.00251	0.00246
	OE	0.00000	0.00000	0.00000
	OE	0.00589	0.00571	0.00570
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00192	0.00186	0.00183
	OE	0.00000	0.00000	0.00000
	OE	0.00448	0.00434	0.00431

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	-0.00042	-0.00043	-0.00049
	OE	0.00000	0.00000	0.00000
	OE	0.00531	0.00512	0.00508
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00031	-0.00032	-0.00036
	OE	0.00000	0.00000	0.00000
	OE	0.00400	0.00386	0.00382

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)	-0.00103	-0.00105	-0.00103
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00096	-0.00097	-0.00097
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00070	-0.00070	-0.00069
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00065	-0.00065	-0.00065

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)	0.00103	0.00105	0.00103
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00099	0.00099	0.00098
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00070	0.00070	0.00069
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00067	0.00067	0.00066

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)	-0.00153	-0.00186	-0.00197
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00145	-0.00180	-0.00194
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00103	-0.00128	-0.00136
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00099	-0.00125	-0.00135

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)	0.00454	0.00437	0.00430
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00446	0.00428	0.00425
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00346	0.00333	0.00328
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00341	0.00327	0.00324

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00558	0.00468	0.17189

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.00024	0.00028

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	0.30258	1.65042	10.28920
	A->Y (FR)	!B	0.23118	1.65494	13.39710
	B->Y (RR)	A	0.26048	1.60698	10.19920
	B->Y (FR)	!A	0.25611	1.71578	13.65770

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	0.24473	1.01052	7.18214
	A->Y (RF)	!B	0.08528	0.75465	7.20322
	B->Y (FF)	A	0.22983	0.99370	7.16820
	B->Y (RF)	!A	0.09343	0.76510	7.21797

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	0.00228	0.00197	0.00181
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00633	0.00602	0.00592
	B	A	0.00000	0.00000	0.00000
	B	A	0.00138	0.00114	0.00099
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00636	0.00614	0.00607

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	0.00713	0.00685	0.00672
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00162	0.00133	0.00117
	B	A	0.00000	0.00000	0.00000
	B	A	0.00658	0.00647	0.00640
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00197	0.00166	0.00150

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.00560	0.00472	0.16678

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.00024	0.00028

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	0.32500	1.67791	10.28510
	A->Y (FR)	B	0.25735	1.71857	13.65380
	B->Y (RR)	!A	0.27128	1.63065	10.23450
	B->Y (FR)	A	0.27732	1.74758	13.68520

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	0.25120	1.00700	7.14869
	A->Y (RF)	B	0.08074	0.76625	7.39939
	B->Y (FF)	!A	0.23872	0.99526	7.10868
	B->Y (RF)	A	0.08732	0.75783	7.14170

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	0.00708	0.00679	0.00671
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00160	0.00116	0.00097
	B	A	0.00000	0.00000	0.00000
	B	A	0.00705	0.00682	0.00676
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00128	0.00103	0.00089

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	0.00129	0.00091	0.00072
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00756	0.00736	0.00731
	B	A	0.00000	0.00000	0.00000
	B	A	0.00128	0.00095	0.00078
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00670	0.00660	0.00653

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, 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	0.05798
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	31382.00000	62763.90000
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
	-0.00145	0.00337	0.05992

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	0.54719	0.51438	0.08631