sky130_osu_sc_12T_ms_ss_1P60_-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_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.01063	0.01066	0.00831	0.57486	0.25089	0.52971
sky130_osu_sc_12T_ms__addf_l	0.01064	0.01066	0.00832	0.42039	0.25191	0.52971

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.00081	0.00093
sky130_osu_sc_12T_ms__addf_l	0.00000	0.00075	0.00093

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)	0.26515	2.21108	23.62680
	B->CO (RR)	0.25604	2.15945	23.25380
	CI->CO (RR)	0.25270	2.22432	24.05460
	CON->CO (FR)	0.05330	1.04396	12.80750
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.25615	2.04796	19.85510
	B->CO (RR)	0.24777	2.01038	19.73440
	CI->CO (RR)	0.24346	2.06123	20.30540
	CON->CO (FR)	0.05883	1.08221	12.25700

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)	0.51872	3.53651	36.41380
	B->CO (FF)	0.47491	3.40623	35.33460
	CI->CO (FF)	0.47117	3.46877	36.27290
	CON->CO (RF)	0.02936	0.63892	8.19263
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.51069	3.25517	30.09860
	B->CO (FF)	0.46825	3.14364	29.27880
	CI->CO (FF)	0.46327	3.18788	29.96790
	CON->CO (RF)	0.03551	0.71225	8.54467

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)	0.37256	1.60561	12.99390
	B->CON (FR)	0.33271	1.52826	12.69850
	CI->CON (FR)	0.32504	1.53811	12.88810
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.35463	1.58936	13.00550
	B->CON (FR)	0.31570	1.51277	12.70980
	CI->CON (FR)	0.30731	1.52186	12.90000

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)	0.13545	0.73890	6.93772
	B->CON (RF)	0.13044	0.74322	7.24681
	CI->CON (RF)	0.12290	0.75356	7.42880
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.13037	0.73458	6.94297
	B->CON (RF)	0.12559	0.73917	7.25307
	CI->CON (RF)	0.11780	0.74925	7.43528

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-R)	0.72053	3.58349	31.18610
	B->S (-R)	0.71248	3.52976	30.71840
	CI->S (-R)	0.66978	3.50996	31.02200
	CON->S (RR)	0.15253	1.07754	9.27316
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.69054	3.56056	31.16710
	B->S (-R)	0.68337	3.50598	30.70010
	CI->S (-R)	0.63973	3.48698	31.00260
	CON->S (RR)	0.15265	1.07756	9.27250

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)	0.49132	1.99696	16.19560
	B->S (-F)	0.48973	1.92538	16.03840
	CI->S (-F)	0.47790	2.00538	16.62420
	CON->S (FF)	0.21499	0.91420	7.04896
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.47979	1.98741	16.18760
	B->S (-F)	0.47881	1.91677	16.03100
	CI->S (-F)	0.46617	1.99615	16.61400
	CON->S (FF)	0.21487	0.91417	7.04894

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	0.00215	0.00208	0.00202
	B	0.00250	0.00251	0.00248
	CI	0.00262	0.00268	0.00265
sky130_osu_sc_12T_ms__addf_l	A	0.00192	0.00184	0.00178
	B	0.00227	0.00226	0.00223
	CI	0.00239	0.00244	0.00240

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00709	0.00707	0.00704
	B	0.00696	0.00701	0.00698
	CI	0.00611	0.00625	0.00621
sky130_osu_sc_12T_ms__addf_l	A	0.00691	0.00687	0.00684
	B	0.00677	0.00682	0.00677
	CI	0.00592	0.00605	0.00598

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00708	0.00707	0.00700
	B	0.00695	0.00699	0.00688
	CI	0.00610	0.00622	0.00616
sky130_osu_sc_12T_ms__addf_l	A	0.00691	0.00688	0.00681
	B	0.00677	0.00681	0.00669
	CI	0.00591	0.00603	0.00597

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00213	0.00206	0.00196
	B	0.00248	0.00249	0.00237
	CI	0.00262	0.00267	0.00259
sky130_osu_sc_12T_ms__addf_l	A	0.00190	0.00183	0.00173
	B	0.00225	0.00226	0.00211
	CI	0.00239	0.00244	0.00235

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00709	0.00707	0.00704
	B	0.00696	0.00701	0.00699
	CI	0.00611	0.00625	0.00620
sky130_osu_sc_12T_ms__addf_l	A	0.00691	0.00688	0.00685
	B	0.00677	0.00682	0.00679
	CI	0.00592	0.00606	0.00601

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01433	0.01438	0.01433
	B	0.01330	0.01306	0.01288
	CI	0.01171	0.01165	0.01158
sky130_osu_sc_12T_ms__addf_l	A	0.01433	0.01439	0.01433
	B	0.01330	0.01306	0.01288
	CI	0.01171	0.01165	0.01158

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00514	0.00548	0.56718	0.57611	0.57380
sky130_osu_sc_12T_ms__addh_l	0.00517	0.00548	0.42699	0.57625	0.42608

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.00080	0.00092
sky130_osu_sc_12T_ms__addh_l	0.00000	0.00068	0.00080

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)	0.18893	1.09954	9.23497
	B->CO (RR)	0.19226	1.08901	9.38335
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.18061	1.13592	8.95628
	B->CO (RR)	0.18384	1.12653	9.13091

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)	0.18187	0.87089	7.30229
	B->CO (FF)	0.18946	0.88328	7.38498
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.18058	0.93989	7.70030
	B->CO (FF)	0.18798	0.95418	7.79271

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)	0.26965	1.15508	9.22591
	B->CON (RR)	0.27282	1.14282	9.37182
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.24981	1.13060	9.12348
	B->CON (RR)	0.25304	1.12003	9.30146

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)	0.22349	0.89856	7.34865
	B->CON (FF)	0.22461	0.90584	7.42773
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.20534	0.87026	7.18290
	B->CON (FF)	0.20674	0.87925	7.26582

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)	0.32198	1.88163	17.77400
	B->S (FR)	0.32359	1.88856	17.86740
	CON->S (FR)	0.05513	1.05175	12.89450
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.30231	1.80049	15.59820
	B->S (FR)	0.30393	1.80967	15.69310
	CON->S (FR)	0.05901	1.08728	12.36360

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)	0.35760	2.00122	18.13270
	B->S (RF)	0.36081	1.98860	18.26450
	CON->S (RF)	0.02879	0.63748	8.21158
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.34335	1.89543	15.39180
	B->S (RF)	0.34669	1.88452	15.56380
	CON->S (RF)	0.03474	0.71577	8.61642

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	0.00352	0.00337	0.00325
	B	0.00000	0.00000	0.00000
	B	0.00329	0.00316	0.00303
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00309	0.00291	0.00281
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00269	0.00260

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	0.00496	0.00480	0.00457
	B	0.00000	0.00000	0.00000
	B	0.00518	0.00518	0.00500
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00452	0.00435	0.00417
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00471	0.00460

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	0.00352	0.00337	0.00325
	B	0.00000	0.00000	0.00000
	B	0.00329	0.00316	0.00303
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00309	0.00291	0.00279
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00269	0.00258

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	0.00496	0.00481	0.00457
	B	0.00000	0.00000	0.00000
	B	0.00518	0.00518	0.00500
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00451	0.00434	0.00410
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00470	0.00448

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	0.00496	0.00481	0.00468
	B	0.00000	0.00000	0.00000
	B	0.00518	0.00519	0.00496
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00452	0.00435	0.00421
	B	0.00000	0.00000	0.00000
	B	0.00474	0.00471	0.00465

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	0.00351	0.00337	0.00324
	B	0.00000	0.00000	0.00000
	B	0.00329	0.00316	0.00301
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00308	0.00291	0.00280
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00269	0.00257

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)	0.44169	0.41874	0.09768
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.44173	0.41872	0.09772

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)	0.44156	0.41774	0.09480
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.44160	0.41778	0.09484

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00278	0.00287	0.56186
sky130_osu_sc_12T_ms__and2_2	0.00279	0.00287	1.14260
sky130_osu_sc_12T_ms__and2_4	0.00278	0.00287	2.23867
sky130_osu_sc_12T_ms__and2_6	0.00282	0.00287	3.32236
sky130_osu_sc_12T_ms__and2_8	0.00278	0.00287	4.37669
sky130_osu_sc_12T_ms__and2_l	0.00209	0.00215	0.42001

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.00035	0.00053
sky130_osu_sc_12T_ms__and2_2	0.00000	0.00054	0.00058
sky130_osu_sc_12T_ms__and2_4	0.00000	0.00093	0.00103
sky130_osu_sc_12T_ms__and2_6	0.00000	0.00131	0.00150
sky130_osu_sc_12T_ms__and2_8	0.00000	0.00169	0.00198
sky130_osu_sc_12T_ms__and2_l	0.00000	0.00020	0.00029

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)	0.14375	1.01473	8.77928
	B->Y (RR)	0.15023	1.01521	8.96662
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.16134	0.92604	9.14967
	B->Y (RR)	0.16772	0.91814	9.32159
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.22208	0.92320	9.67452
	B->Y (RR)	0.22864	0.90830	9.75830
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.28397	0.96346	10.04540
	B->Y (RR)	0.29020	0.94652	10.07320
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.34350	1.01433	10.33960
	B->Y (RR)	0.34992	0.99835	10.35780
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.14865	1.07467	8.65582
	B->Y (RR)	0.15527	1.07807	8.84742

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)	0.13851	0.78526	6.68943
	B->Y (FF)	0.14442	0.79845	6.78921
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.16899	0.78276	7.07985
	B->Y (FF)	0.17352	0.79163	7.16168
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.24624	0.84393	7.63167
	B->Y (FF)	0.24702	0.84450	7.68234
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.32596	0.92344	8.02936
	B->Y (FF)	0.32265	0.92125	8.06084
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.40117	1.00381	8.31620
	B->Y (FF)	0.39482	0.99673	8.33929
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.13695	0.82443	6.55212
	B->Y (FF)	0.14699	0.84230	6.63908

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	0.00252	0.00220	0.00215
	B	0.00000	0.00000	0.00000
	B	0.00256	0.00224	0.00214
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00465	0.00451	0.00454
	B	0.00000	0.00000	0.00000
	B	0.00470	0.00457	0.00459
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00953	0.00974	0.00985
	B	0.00000	0.00000	0.00000
	B	0.00960	0.00989	0.00987
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01440	0.01501	0.01521
	B	0.00000	0.00000	0.00000
	B	0.01448	0.01502	0.01522
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01927	0.01986	0.02066
	B	0.00000	0.00000	0.00000
	B	0.01933	0.02003	0.02077
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00193	0.00171	0.00166
	B	0.00000	0.00000	0.00000
	B	0.00196	0.00174	0.00170

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	0.00619	0.00604	0.00598
	B	0.00000	0.00000	0.00000
	B	0.00694	0.00676	0.00670
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00769	0.00789	0.00784
	B	0.00000	0.00000	0.00000
	B	0.00847	0.00858	0.00853
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01146	0.01230	0.01240
	B	0.00000	0.00000	0.00000
	B	0.01225	0.01297	0.01302
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01535	0.01685	0.01714
	B	0.00000	0.00000	0.00000
	B	0.01613	0.01747	0.01769
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01904	0.02109	0.02163
	B	0.00000	0.00000	0.00000
	B	0.01983	0.02169	0.02211
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00463	0.00449	0.00449
	B	0.00000	0.00000	0.00000
	B	0.00514	0.00499	0.00498

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)	-0.00208	-0.00209	-0.00210
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00208	-0.00209	-0.00210
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00208	-0.00208	-0.00210
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00209	-0.00211	-0.00212
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00207	-0.00210	-0.00210
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00144	-0.00145	-0.00145

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)	0.00209	0.00215	0.00210
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00209	0.00214	0.00210
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00209	0.00214	0.00210
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00211	0.00214	0.00212
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00209	0.00212	0.00210
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00145	0.00149	0.00146

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)	-0.00198	-0.00199	-0.00199
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00198	-0.00200	-0.00199
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00198	-0.00200	-0.00199
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00198	-0.00200	-0.00199
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00198	-0.00199	-0.00199
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00138	-0.00139	-0.00139

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)	0.00198	0.00202	0.00199
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00198	0.00202	0.00199
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00198	0.00200	0.00199
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00198	0.00200	0.00199
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00198	0.00200	0.00199
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00138	0.00141	0.00139

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00250	0.00269	0.00267	0.24691

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00017	0.00024

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)	0.18616	1.44476	12.93240
	A1->Y (FR)	0.15232	1.34168	12.41680
	B0->Y (FR)	0.15164	1.38741	12.87400

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)	0.06687	0.65764	6.75009
	A1->Y (RF)	0.06203	0.67253	7.12651
	B0->Y (RF)	0.04205	0.62444	6.98629

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	0.00483	0.00477	0.00447
	A1	0.00000	0.00000	0.00000
	A1	0.00412	0.00404	0.00399
	B0	0.00411	0.00398	0.00343

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	0.00075	0.00062	0.00054
	A1	0.00000	0.00000	0.00000
	A1	0.00076	0.00061	0.00052
	B0	-0.00040	-0.00040	-0.00049

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)	-0.00163	-0.00170	-0.00168
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00172	-0.00172	-0.00172
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00172	-0.00173	-0.00173

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)	0.00168	0.00170	0.00168
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00172	0.00175	0.00173
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00172	0.00173	0.00173

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)	-0.00163	-0.00170	-0.00169
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00172	-0.00173	-0.00173
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00189	-0.00191	-0.00191

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)	0.00168	0.00170	0.00169
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00172	0.00173	0.00173
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00190	0.00196	0.00192

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)	-0.00097	-0.00099	-0.00097

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)	0.00105	0.00106	0.00099

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00250	0.00269	0.00285	0.00264	0.24500

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_1	0.00000	0.00023	0.00047

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)	0.23676	1.50168	12.97710
	A1->Y (FR)	0.21092	1.46791	12.90980
	B0->Y (FR)	0.16052	1.39005	12.84620
	B1->Y (FR)	0.18678	1.41917	12.89100

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)	0.08504	0.67642	6.75384
	A1->Y (RF)	0.08011	0.69130	7.12937
	B0->Y (RF)	0.05125	0.65688	7.08516
	B1->Y (RF)	0.05634	0.64165	6.71150

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	0.00595	0.00588	0.00573
	A1	0.00525	0.00515	0.00497
	B0	0.00441	0.00427	0.00420
	B1	0.00513	0.00487	0.00436

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00164	0.00151	0.00140
	A1	0.00165	0.00151	0.00139
	B0	-0.00024	-0.00025	-0.00034
	B1	-0.00024	-0.00024	-0.00033

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)	-0.00164	-0.00169	-0.00168
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00172	-0.00173	-0.00172
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00172	-0.00173	-0.00172
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00172	-0.00173	-0.00172

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)	0.00168	0.00169	0.00168
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00172	0.00175	0.00173
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00172	0.00175	0.00173
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00172	0.00175	0.00173

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)	-0.00163	-0.00169	-0.00168
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00172	-0.00174	-0.00173
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00188	-0.00190	-0.00190
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00188	-0.00190	-0.00190

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)	0.00168	0.00169	0.00168
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00172	0.00176	0.00173
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00190	0.00195	0.00191
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00189	0.00195	0.00191

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)	-0.00097	-0.00099	-0.00097
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00096	-0.00097	-0.00097
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00197	-0.00200	-0.00199
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00197	-0.00197	-0.00199

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)	0.00108	0.00107	0.00100
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00096	0.00098	0.00097
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00199	0.00200	0.00200
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00199	0.00200	0.00200

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)	-0.00098	-0.00100	-0.00098
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00097	-0.00098	-0.00098
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00182	-0.00183	-0.00183
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00182	-0.00183	-0.00183

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)	0.00109	0.00110	0.00101
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00098	0.00098	0.00098
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00182	0.00184	0.00183
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00182	0.00184	0.00183

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00290	0.53644
sky130_osu_sc_12T_ms__buf_2	0.00290	1.11154
sky130_osu_sc_12T_ms__buf_4	0.00289	2.21979
sky130_osu_sc_12T_ms__buf_6	0.00084	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00289	4.31252
sky130_osu_sc_12T_ms__buf_l	0.00213	0.42341

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00029	0.00029
sky130_osu_sc_12T_ms__buf_2	0.00000	0.00043	0.00053
sky130_osu_sc_12T_ms__buf_4	0.00000	0.00072	0.00100
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.00130	0.00195
sky130_osu_sc_12T_ms__buf_l	0.00000	0.00017	0.00017

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)**	0.10455	0.97998	8.72918
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.10705	0.86115	9.01645
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.14191	0.82781	9.48910
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.21272	0.86056	9.94501
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.10966	1.02973	8.59741

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)**	0.13214	0.76860	6.50012
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.16204	0.77128	6.95771
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.23944	0.83286	7.57246
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.39446	0.99435	8.24960
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.13343	0.81611	6.52874

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	0.00243	0.00202	0.00191
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00457	0.00431	0.00428
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00950	0.00957	0.00971
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01919	0.01988	0.02427
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00187	0.00160	0.00152

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	0.00609	0.00585	0.00582
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00757	0.00758	0.00754
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01137	0.01194	0.01204
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01899	0.02070	0.02108
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00463	0.00443	0.00445

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
	-0.00051	-0.00051	-0.00051

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
	0.00051	0.00051	0.00051

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00262	0.00265	0.00859	0.56121	0.56465
sky130_osu_sc_12T_ms__dffnr_l	0.00262	0.00265	0.00859	0.42613	0.42448

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.00120	0.00158
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.00109	0.00146

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FR)	0.82119	2.38689	17.58870
	QN->Q (FR)	0.05931	1.10562	13.57040
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.80780	2.51723	17.89750
	QN->Q (FR)	0.06195	1.13764	12.87170

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)	0.52263	2.22673	19.66350
	QN->Q (RF)	0.03213	0.68004	8.66525
	RN->Q (FF)	0.46085	2.20263	19.90330
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.52544	2.43804	20.26300
	QN->Q (RF)	0.03732	0.74797	8.97631
	RN->Q (FF)	0.46370	2.41421	20.49970

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)	0.45151	1.41503	11.03210
	RN->QN (FR)	0.38922	1.39086	11.27420
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.44191	1.45703	10.82600
	RN->QN (FR)	0.37955	1.43282	11.06350

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	**CK->QN (FF)**	0.72051	1.43939	7.57852
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.70500	1.48350	7.98999

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)	-0.14925	-0.39875	-3.46168
	setup	CK (F)	0.33062	0.42900	3.50201
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14945	-0.39875	-3.46182
	setup	CK (F)	0.33165	0.42900	3.50210

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)	-0.18699	-0.21638	-1.25155
	setup	CK (F)	0.38710	0.38698	1.60270
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18445	-0.21793	-1.25252
	setup	CK (F)	0.38421	0.38701	1.61010

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)	-0.14925	-0.39875	-3.46168
	setup	CK (F)	0.33062	0.42900	3.50201
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.14945	-0.39875	-3.46182
	setup	CK (F)	0.33165	0.42900	3.50210

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)	-0.18699	-0.21638	-1.25155
	setup	CK (F)	0.38710	0.38698	1.60270
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18445	-0.21793	-1.25252
	setup	CK (F)	0.38421	0.38701	1.61010

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)	0.28031	0.24717	-0.54470
	removal	CK (F)	-0.16284	-0.13634	0.60598
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.28044	0.24761	-0.54293
	removal	CK (F)	-0.16284	-0.13634	0.60598

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)	0.28031	0.24717	-0.54470
	removal	CK (F)	-0.16284	-0.13634	0.60598
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.28044	0.24761	-0.54293
	removal	CK (F)	-0.16284	-0.13634	0.60598

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 ()	0.29661	0.59417	13.33370
	min_pulse_width	RN ()	0.29768	0.59638	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.28552	0.58975	13.33370
	min_pulse_width	RN ()	0.28776	0.58975	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 ()	0.32823	0.47485	13.33370
	min_pulse_width	CK ()	0.43551	0.47485	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.33180	0.47485	13.33370
	min_pulse_width	CK ()	0.43551	0.47485	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 ()	0.34049	0.57649	13.33370
	min_pulse_width	CK ()	0.27343	0.60301	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.32957	0.57649	13.33370
	min_pulse_width	CK ()	0.26922	0.59859	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	0.01152	0.01111	0.00617
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01087	0.01054	0.00775

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	0.01153	0.01101	0.00814
	RN	-0.00084	-0.03183	-0.35918
	RN	0.01483	0.01446	0.01133
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01087	0.01040	0.00870
	RN	-0.00084	-0.02698	-0.27272
	RN	0.01415	0.01384	0.01185

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	0.01154	0.01102	0.00809
	RN	-0.00084	-0.03194	-0.36138
	RN	0.01483	0.01446	0.01128
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01087	0.01040	0.00869
	RN	-0.00084	-0.02692	-0.27167
	RN	0.01415	0.01384	0.01187

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	0.01151	0.01110	0.00622
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.01085	0.01053	0.00777

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)	0.00701	0.00670	0.00649
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00221	0.00195	0.00178
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00185	-0.00191	-0.00190
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)	0.00701	0.00670	0.00649
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00221	0.00195	0.00178
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00185	-0.00191	-0.00190

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)	0.01110	0.01093	0.01072
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00588	0.00572	0.00565
	!CK	0.00000	0.00000	0.00000
	!CK	0.00189	0.00192	0.00190
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)	0.01110	0.01093	0.01072
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00588	0.00572	0.00565
	!CK	0.00000	0.00000	0.00000
	!CK	0.00189	0.00192	0.00190

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)	0.00745	0.00689	0.00662
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00238	0.00202	0.00189
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00745	0.00689	0.00662
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00238	0.00202	0.00189

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)	0.01140	0.01102	0.01071
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00597	0.00573	0.00566
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01140	0.01102	0.01071
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00597	0.00573	0.00566

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)	-0.00027	-0.00078	-0.00101
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00790	0.00678	0.00636
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00231	0.00141	0.00111
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00927	0.00848	0.00801
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00022	-0.00075	-0.00095
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00027	-0.00078	-0.00101
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00789	0.00678	0.00635
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00231	0.00141	0.00111
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00927	0.00848	0.00801
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00022	-0.00075	-0.00095

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)	0.00984	0.00940	0.00925
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01234	0.01171	0.01155
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01022	0.00983	0.00969
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00984	0.00940	0.00925
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01234	0.01171	0.01155
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01022	0.00983	0.00969

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00262	0.00265	0.00849	0.56864	0.56419
sky130_osu_sc_12T_ms__dffr_l	0.00262	0.00265	0.00847	0.42531	0.42470

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.00120	0.00159
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.00109	0.00147

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)	0.65714	2.09587	15.46200
	QN->Q (FR)	0.05931	1.11104	13.67110
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.64346	2.21440	15.57520
	QN->Q (FR)	0.06195	1.13678	12.87530

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)	0.63848	2.27702	18.35260
	QN->Q (RF)	0.03212	0.68232	8.70985
	RN->Q (FF)	0.46094	2.21562	20.11150
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.64133	2.47678	18.72850
	QN->Q (RF)	0.03732	0.74754	8.96922
	RN->Q (FF)	0.46436	2.41336	20.47170

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)	0.56735	1.45517	9.50933
	RN->QN (FR)	0.38993	1.39204	11.27080
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.55772	1.49779	9.32392
	RN->QN (FR)	0.38025	1.43442	11.06930

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)**	0.55610	1.13873	5.28993
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.54051	1.18240	5.71362

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)	-0.09562	-0.11395	-0.65436
	setup	CK (R)	0.48791	0.47814	1.53802
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.09560	-0.11398	-0.65445
	setup	CK (R)	0.48854	0.47924	1.54409

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)	-0.27786	-0.61253	-7.45223
	setup	CK (R)	0.32517	0.63503	7.50514
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.27754	-0.61097	-7.45196
	setup	CK (R)	0.32517	0.63503	7.50514

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)	-0.09562	-0.11395	-0.65436
	setup	CK (R)	0.48791	0.47814	1.53802
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.09560	-0.11398	-0.65445
	setup	CK (R)	0.48854	0.47924	1.54409

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)	-0.27786	-0.61253	-7.45223
	setup	CK (R)	0.32517	0.63503	7.50514
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.27754	-0.61097	-7.45196
	setup	CK (R)	0.32517	0.63503	7.50514

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)	0.43910	0.43728	1.26499
	removal	CK (R)	-0.06337	-0.07553	-0.04470
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.43894	0.43954	1.27149
	removal	CK (R)	-0.06555	-0.07668	-0.04187

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)	0.43910	0.43728	1.26499
	removal	CK (R)	-0.06337	-0.07553	-0.04470
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.43894	0.43954	1.27149
	removal	CK (R)	-0.06555	-0.07668	-0.04187

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 ()	0.29768	0.59638	13.33370
	min_pulse_width	RN ()	0.29661	0.59417	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.28881	0.59196	13.33370
	min_pulse_width	RN ()	0.28776	0.58975	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 ()	0.27101	0.47485	13.33370
	min_pulse_width	CK ()	0.35326	0.47485	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.25312	0.47485	13.33370
	min_pulse_width	CK ()	0.34253	0.47485	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 ()	0.65188	0.69139	13.33370
	min_pulse_width	CK ()	0.26999	0.55661	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.65188	0.69139	13.33370
	min_pulse_width	CK ()	0.26999	0.55661	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	0.00599	0.00524	0.00036
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00534	0.00468	0.00205

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	0.00681	0.00631	0.00334
	RN	-0.00084	-0.03208	-0.36393
	RN	0.01539	0.01501	0.01183
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00614	0.00570	0.00395
	RN	-0.00084	-0.02695	-0.27220
	RN	0.01471	0.01440	0.01243

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	0.00682	0.00631	0.00335
	RN	-0.00084	-0.03193	-0.36108
	RN	0.01539	0.01502	0.01182
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00614	0.00570	0.00395
	RN	-0.00084	-0.02693	-0.27181
	RN	0.01471	0.01440	0.01241

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	0.00598	0.00523	0.00036
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00533	0.00466	0.00188

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	-0.00162	-0.00171	-0.00171
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00710	0.00678	0.00657
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00274	0.00248	0.00231
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00162	-0.00171	-0.00171
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00710	0.00678	0.00657
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00274	0.00248	0.00231

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	0.00169	0.00172	0.00171
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01102	0.01084	0.01064
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00535	0.00519	0.00514
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00169	0.00172	0.00171
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01102	0.01084	0.01064
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00535	0.00519	0.00514

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)	0.00238	0.00202	0.00188
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00705	0.00649	0.00622
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)	0.00238	0.00202	0.00188
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00705	0.00649	0.00622

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)	0.00597	0.00573	0.00566
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01180	0.01142	0.01111
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)	0.00597	0.00573	0.00566
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01180	0.01142	0.01111

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)	-0.00042	-0.00091	-0.00114
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00355	0.00284	0.00236
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00046	-0.00095	-0.00117
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00042	-0.00090	-0.00114
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00355	0.00284	0.00236
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00046	-0.00095	-0.00117

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)	0.00966	0.00929	0.00913
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01868	0.01802	0.01740
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01413	0.01370	0.01322
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01861	0.01792	0.01756
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01016	0.00974	0.00965
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00966	0.00929	0.00913
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01867	0.01802	0.01740
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01413	0.01371	0.01322
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01861	0.01792	0.01756
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01016	0.00974	0.00965

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00258	0.00266	0.00614	0.00863	0.58130	0.58269
sky130_osu_sc_12T_ms__dffsr_l	0.00258	0.00266	0.00614	0.00862	0.42086	0.42536

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.00132	0.00164
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.00120	0.00152

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RR)	0.69730	2.14813	15.74900
	QN->Q (FR)	0.05650	1.09257	13.41840
	RN->Q (RR)	0.57123	2.03547	15.80810
	SN->Q (FR)	0.54770	2.09719	18.16590
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.69355	2.27163	15.62390
	QN->Q (FR)	0.06184	1.13151	12.76360
	RN->Q (RR)	0.56789	2.15991	15.68610
	SN->Q (FR)	0.54296	2.22026	18.00990

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RF)	0.72366	2.36665	18.50310
	QN->Q (RF)	0.03189	0.68575	8.78163
	RN->Q (FF)	0.49087	2.23921	20.28220
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.72771	2.55976	18.65220
	QN->Q (RF)	0.03713	0.74456	8.92653
	RN->Q (FF)	0.49684	2.43721	20.42030

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)	0.65108	1.54630	9.65023
	RN->QN (FR)	0.42009	1.41993	11.44310
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.64190	1.59335	9.43641
	RN->QN (FR)	0.41261	1.46909	11.20410

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)	0.60120	1.20073	5.57800
	RN->QN (RF)	0.47521	1.09078	5.62604
	SN->QN (FF)	0.45165	1.15256	7.96867
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.59310	1.24925	5.90816
	RN->QN (RF)	0.46703	1.13972	5.96630
	SN->QN (FF)	0.44258	1.19950	8.26708

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)	-0.11503	-0.13500	-0.78050
	setup	CK (R)	0.51198	0.49332	1.49920
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.11537	-0.13500	-0.78049
	setup	CK (R)	0.51345	0.49604	1.49935

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)	-0.31852	-0.64411	-7.65931
	setup	CK (R)	0.37742	0.66515	7.69463
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.31794	-0.64187	-7.65772
	setup	CK (R)	0.37721	0.66514	7.69458

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)	-0.11503	-0.13500	-0.78050
	setup	CK (R)	0.51198	0.49332	1.49920
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.11537	-0.13500	-0.78049
	setup	CK (R)	0.51345	0.49604	1.49935

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)	-0.31852	-0.64411	-7.65931
	setup	CK (R)	0.37742	0.66515	7.69463
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.31794	-0.64187	-7.65772
	setup	CK (R)	0.37721	0.66514	7.69458

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)	0.42517	0.41866	1.23225
	removal	CK (R)	-0.05740	-0.06539	-0.10229
	hold	SN (R)	-0.44671	-0.68862	-6.02875
	setup	SN (R)	0.47003	0.73425	7.49938
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.42463	0.41962	1.23141
	removal	CK (R)	-0.05740	-0.06539	-0.10229
	hold	SN (R)	-0.43006	-0.67114	-5.94763
	setup	SN (R)	0.46856	0.72007	7.42115

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)	0.42517	0.41866	1.23225
	removal	CK (R)	-0.05740	-0.06539	-0.10229
	hold	SN (R)	-0.44778	-0.68862	-6.02875
	hold	SN (R)	-0.44671	-0.68935	-6.03150
	setup	SN (R)	0.46746	0.73208	7.45735
	setup	SN (R)	0.47003	0.73425	7.49938
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.42463	0.41962	1.23141
	removal	CK (R)	-0.05740	-0.06539	-0.10229
	hold	SN (R)	-0.43809	-0.67114	-5.94763
	hold	SN (R)	-0.43006	-0.67154	-5.96203
	setup	SN (R)	0.46856	0.71596	7.39125
	setup	SN (R)	0.44465	0.72007	7.42115

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 ()	0.33306	0.61626	13.33370
	min_pulse_width	RN ()	0.34008	0.61626	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.32490	0.61406	13.33370
	min_pulse_width	RN ()	0.33305	0.61184	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)	0.06646	0.08507	1.20535
	removal	CK (R)	-0.02043	-0.05329	-0.56523
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.06640	0.08482	1.08283
	removal	CK (R)	-0.02043	-0.05329	-0.56523

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)	0.06646	0.08507	1.20535
	removal	CK (R)	-0.02043	-0.05329	-0.56523
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.06640	0.08482	1.08283
	removal	CK (R)	-0.02043	-0.05329	-0.56523

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 ()	0.43808	0.73558	13.33370
	min_pulse_width	SN ()	0.44369	0.73558	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.43176	0.72011	13.33370
	min_pulse_width	SN ()	0.42332	0.72453	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 ()	0.30319	0.47485	13.33370
	min_pulse_width	CK ()	0.37114	0.47485	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.28889	0.47485	13.33370
	min_pulse_width	CK ()	0.36399	0.47485	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	CK ()	0.67933	0.70906	13.33370
	min_pulse_width	CK ()	0.32683	0.58754	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.67663	0.70906	13.33370
	min_pulse_width	CK ()	0.32683	0.58754	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	0.00727	0.00657	0.00175
	RN	0.01367	0.01312	0.00827
	SN	-0.00084	-0.03251	-0.37203
	SN	0.01492	0.01445	0.00957
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00666	0.00605	0.00332
	RN	0.01304	0.01259	0.00988
	SN	-0.00084	-0.02678	-0.26935
	SN	0.01430	0.01392	0.01125

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	0.00776	0.00740	0.00518
	RN	-0.00084	-0.03251	-0.37203
	RN	0.01627	0.01595	0.01354
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00711	0.00673	0.00500
	RN	-0.00084	-0.02678	-0.26935
	RN	0.01561	0.01528	0.01335

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	0.00777	0.00740	0.00516
	RN	-0.00084	-0.03255	-0.37292
	RN	0.01627	0.01595	0.01346
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00711	0.00674	0.00499
	RN	-0.00084	-0.02695	-0.27223
	RN	0.01561	0.01527	0.01328

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	0.00726	0.00655	0.00158
	RN	0.01366	0.01310	0.00806
	SN	-0.00084	-0.03255	-0.37290
	SN	0.01491	0.01443	0.00952
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00664	0.00603	0.00334
	RN	0.01303	0.01257	0.00988
	SN	-0.00084	-0.02695	-0.27222
	SN	0.01429	0.01391	0.01117

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	-0.00166	-0.00173	-0.00172
	(!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)	0.00889	0.00862	0.00840
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00303	0.00278	0.00262
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00301	0.00276	0.00260
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00305	0.00280	0.00263
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00166	-0.00173	-0.00172
	(!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)	0.00889	0.00862	0.00840
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00303	0.00278	0.00262
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00301	0.00276	0.00260
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00305	0.00280	0.00263

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	0.00171	0.00174	0.00172
	(!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)	0.01258	0.01242	0.01216
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00596	0.00582	0.00576
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00598	0.00585	0.00578
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00594	0.00580	0.00574
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00171	0.00174	0.00172
	(!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)	0.01258	0.01242	0.01216
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00596	0.00582	0.00576
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00598	0.00585	0.00578
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00594	0.00580	0.00574

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)	0.00217	0.00180	0.00160
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00844	0.00791	0.00755
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)	0.00217	0.00180	0.00160
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00844	0.00791	0.00755

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)	0.00663	0.00638	0.00630
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01262	0.01220	0.01184
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)	0.00663	0.00638	0.00630
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01262	0.01220	0.01184

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)	-0.00441	-0.00444	-0.00444
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00474	-0.00481	-0.00480
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00443	-0.00449	-0.00447
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00179	0.00146	0.00117
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)	-0.00441	-0.00445	-0.00444
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00474	-0.00481	-0.00480
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00443	-0.00449	-0.00447
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00179	0.00145	0.00117

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)	0.00443	0.00446	0.00446
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00480	0.00483	0.00480
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00445	0.00449	0.00447
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01000	0.00977	0.00973
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)	0.00443	0.00447	0.00446
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00480	0.00483	0.00480
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00445	0.00449	0.00447
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01000	0.00976	0.00973

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)	-0.00048	-0.00096	-0.00120
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00430	0.00363	0.00316
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00426	0.00360	0.00310
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00034	-0.00084	-0.00106
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00236	0.00149	0.00112
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00048	-0.00096	-0.00120
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00430	0.00364	0.00316
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00426	0.00360	0.00310
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00034	-0.00084	-0.00106
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00236	0.00149	0.00112

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)	0.02069	0.02006	0.01945
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00987	0.00946	0.00930
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01434	0.01397	0.01351
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01439	0.01395	0.01353
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02027	0.01951	0.01906
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01016	0.00974	0.00966
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01305	0.01234	0.01217
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02068	0.02006	0.01945
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00987	0.00946	0.00930
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01434	0.01397	0.01351
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01439	0.01395	0.01353
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02026	0.01949	0.01906
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01016	0.00974	0.00966
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01305	0.01234	0.01217

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00260	0.00508	0.00849	0.56615	0.56855
sky130_osu_sc_12T_ms__dffs_l	0.00260	0.00508	0.00849	0.42905	0.42793

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.00114	0.00127
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.00102	0.00115

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)	0.44520	1.85041	15.16640
	QN->Q (FR)	0.05937	1.11834	13.60410
	SN->Q (FR)	0.35722	1.87228	16.88960
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.44488	1.99995	15.48430
	QN->Q (FR)	0.06194	1.13825	12.91940
	SN->Q (FR)	0.35617	2.02100	17.16460

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RF)	0.70982	2.34812	18.33080
	QN->Q (RF)	0.03196	0.67959	8.67731
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.70468	2.54937	18.91680
	QN->Q (RF)	0.03719	0.74784	8.98885

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)	0.63565	1.53178	9.62377
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.61835	1.56567	9.43444

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)	0.35788	0.90748	5.10856
	SN->QN (FF)	0.26827	0.93073	6.81591
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.35390	0.96922	5.54722
	SN->QN (FF)	0.26368	0.99148	7.21661

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)	-0.07732	-0.09813	-0.60158
	setup	CK (R)	0.30983	0.30615	1.39894
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07429	-0.09761	-0.60125
	setup	CK (R)	0.30962	0.30641	1.40016

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)	-0.28722	-0.61966	-7.50956
	setup	CK (R)	0.36407	0.64546	7.56164
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.28497	-0.61867	-7.51048
	setup	CK (R)	0.36436	0.64546	7.56173

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)	-0.07732	-0.09813	-0.60158
	setup	CK (R)	0.30983	0.30615	1.39894
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.07429	-0.09761	-0.60125
	setup	CK (R)	0.30962	0.30641	1.40016

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)	-0.28722	-0.61966	-7.50956
	setup	CK (R)	0.36407	0.64546	7.56164
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.28497	-0.61867	-7.51048
	setup	CK (R)	0.36436	0.64546	7.56173

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)	0.08454	0.11445	1.06289
	removal	CK (R)	-0.03287	-0.07212	-0.71129
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.08673	0.11581	0.99324
	removal	CK (R)	-0.03282	-0.07074	-0.70867

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)	0.08454	0.11445	1.06289
	removal	CK (R)	-0.03287	-0.07212	-0.71129
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.08673	0.11581	0.99324
	removal	CK (R)	-0.03282	-0.07074	-0.70867

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 ()	0.24747	0.62510	13.33370
	min_pulse_width	SN ()	0.25137	0.62289	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.24245	0.61184	13.33370
	min_pulse_width	SN ()	0.24095	0.61406	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 ()	0.16372	0.47485	13.33370
	min_pulse_width	CK ()	0.36399	0.47485	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.15657	0.47485	13.33370
	min_pulse_width	CK ()	0.35326	0.47485	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 ()	0.47121	0.57870	13.33370
	min_pulse_width	CK ()	0.31603	0.56765	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.46901	0.57870	13.33370
	min_pulse_width	CK ()	0.31603	0.56765	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	0.00599	0.00523	0.00051
	SN	-0.00084	-0.03199	-0.36234
	SN	0.01285	0.01221	0.00754
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00533	0.00465	0.00191
	SN	-0.00084	-0.02709	-0.27459
	SN	0.01217	0.01165	0.00886

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	0.00677	0.00631	0.00342
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00611	0.00570	0.00396

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	0.00678	0.00631	0.00340
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00611	0.00570	0.00398

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	0.00598	0.00521	0.00042
	SN	-0.00084	-0.03208	-0.36385
	SN	0.01282	0.01220	0.00732
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00531	0.00464	0.00185
	SN	-0.00084	-0.02705	-0.27386
	SN	0.01215	0.01163	0.00883

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	-0.00169	-0.00176	-0.00175
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00697	0.00666	0.00637
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00273	0.00247	0.00230
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00169	-0.00176	-0.00175
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00697	0.00666	0.00637
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00273	0.00247	0.00230

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	0.00174	0.00176	0.00175
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01102	0.01084	0.01064
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00545	0.00530	0.00525
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00174	0.00176	0.00175
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01102	0.01084	0.01064
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00545	0.00530	0.00525

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)	-0.00323	-0.00323	-0.00324
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00217	0.00185	0.00168
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)	-0.00323	-0.00323	-0.00324
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00217	0.00185	0.00168

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)	0.00323	0.00326	0.00325
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00703	0.00673	0.00664
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)	0.00323	0.00326	0.00325
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00703	0.00673	0.00664

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)	-0.00042	-0.00090	-0.00114
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00038	-0.00089	-0.00110
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00212	0.00124	0.00090
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00042	-0.00090	-0.00114
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00037	-0.00089	-0.00110
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00212	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)	0.01862	0.01797	0.01735
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00967	0.00929	0.00914
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01853	0.01775	0.01738
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01010	0.00969	0.00960
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01232	0.01166	0.01149
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01862	0.01797	0.01735
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00967	0.00929	0.00914
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01853	0.01775	0.01738
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01010	0.00969	0.00960
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01232	0.01165	0.01149

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00275	0.00823	0.52859
sky130_osu_sc_12T_ms__dff_l	0.00275	0.00821	0.40463

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.00115	0.00125
sky130_osu_sc_12T_ms__dff_l	0.00000	0.00104	0.00114

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)**	0.38947	1.27502	9.11557
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.38670	1.32198	8.94217

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)**	0.59044	1.12965	5.33829
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.58714	1.19802	5.80491

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)	-0.08344	-0.10572	-0.68746
	setup	CK (R)	0.25736	0.25716	1.37336
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.08329	-0.10572	-0.68701
	setup	CK (R)	0.25649	0.25851	1.37685

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)	-0.26990	-0.62001	-7.55381
	setup	CK (R)	0.32105	0.64695	7.63297
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.27220	-0.61679	-7.55240
	setup	CK (R)	0.32108	0.64695	7.63250

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 ()	0.15657	0.47485	13.33370
	min_pulse_width	CK ()	0.33180	0.47485	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.15299	0.47485	13.33370
	min_pulse_width	CK ()	0.32465	0.47485	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 ()**	0.41979	0.56544	13.33370
	min_pulse_width	**CK ()**	0.26011	0.56765	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.41979	0.56544	13.33370
	min_pulse_width	**CK ()**	0.26011	0.56765	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	0.01268	0.01158	0.01100
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01132	0.01021	0.00968

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	0.01391	0.01327	0.01274
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01258	0.01193	0.01140

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	-0.00161	-0.00169	-0.00169
	!CK	0.00000	0.00000	0.00000
	!CK	0.00646	0.00614	0.00587
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00161	-0.00169	-0.00169
	!CK	0.00000	0.00000	0.00000
	!CK	0.00646	0.00614	0.00587

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	0.00168	0.00169	0.00169
	!CK	0.00000	0.00000	0.00000
	!CK	0.01152	0.01126	0.01105
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00168	0.00169	0.00169
	!CK	0.00000	0.00000	0.00000
	!CK	0.01152	0.01126	0.01105

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)	-0.00045	-0.00093	-0.00116
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00037	-0.00088	-0.00108
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00045	-0.00093	-0.00116
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00037	-0.00088	-0.00108

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)	0.00964	0.00924	0.00911
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01807	0.01744	0.01686
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01888	0.01806	0.01766
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01004	0.00962	0.00954
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00964	0.00926	0.00911
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01807	0.01744	0.01686
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01888	0.01806	0.01766
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.01004	0.00962	0.00954

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00269	0.53802
sky130_osu_sc_12T_ms__inv_10	0.02390	5.42786
sky130_osu_sc_12T_ms__inv_2	0.00498	1.10907
sky130_osu_sc_12T_ms__inv_3	0.00736	1.63877
sky130_osu_sc_12T_ms__inv_4	0.00968	2.20775
sky130_osu_sc_12T_ms__inv_6	0.01449	3.26367
sky130_osu_sc_12T_ms__inv_8	0.01920	4.36665
sky130_osu_sc_12T_ms__inv_l	0.00210	0.39959

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00014	0.00024
sky130_osu_sc_12T_ms__inv_10	0.00000	0.00144	0.00237
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00029	0.00047
sky130_osu_sc_12T_ms__inv_3	0.00000	0.00043	0.00071
sky130_osu_sc_12T_ms__inv_4	0.00000	0.00058	0.00095
sky130_osu_sc_12T_ms__inv_6	0.00000	0.00087	0.00142
sky130_osu_sc_12T_ms__inv_8	0.00000	0.00115	0.00190
sky130_osu_sc_12T_ms__inv_l	0.00000	0.00008	0.00012

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)**	0.05804	1.06643	12.87470
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.05435	0.69106	12.89410
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.04088	0.89680	12.85080
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.04247	0.83627	12.88920
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.04027	0.78944	12.86840
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.04286	0.73715	12.78570
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.04790	0.70505	12.86000
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.06257	1.09136	12.19430

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)**	0.02930	0.62718	7.98211
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.03514	0.46663	8.19394
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02299	0.56633	8.08549
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.02444	0.54212	8.17241
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02371	0.51876	8.17497
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02706	0.49254	8.16913
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03088	0.47826	8.20186
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.03573	0.70053	8.37080

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	0.00312	0.00306	0.00302
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02547	0.02482	0.02598
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00534	0.00529	0.00529
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00823	0.00799	0.00816
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01046	0.01039	0.01046
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01552	0.01551	0.01007
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02052	0.01998	0.02086
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00243	0.00238	0.00240

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	-0.00048	-0.00053	-0.00056
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00875	-0.00887	-0.00798
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00162	-0.00168	-0.00167
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00208	-0.00220	-0.00214
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00329	-0.00345	-0.00326
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00501	-0.00517	-0.00485
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00682	-0.00690	-0.00642
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00034	-0.00038	-0.00041

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.33179	0.33314	0.00555	0.50128

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00046	0.00071

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)	-	0.02757	0.64951	8.30397
	A1->Y (RR)	-	0.03393	0.65449	8.32061
	S0->Y (RR)	(!A0 * A1)	0.08067	0.77506	7.62739
	S0->Y (FR)	(A0 * !A1)	0.06001	0.87185	9.16906

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)	-	0.02655	0.55671	7.13389
	A1->Y (FF)	-	0.02251	0.55485	7.11866
	S0->Y (FF)	(!A0 * A1)	0.13214	0.73345	6.35428
	S0->Y (RF)	(A0 * !A1)	0.03176	0.60149	7.05457

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	-	-0.00295	-0.00295	-0.00295
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00195	-0.00196	-0.00195
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00430	0.00401	0.00397
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00185	-0.00231	-0.00242

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	-	0.00295	0.00295	0.00295
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00195	0.00196	0.00196
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00054	0.00009	-0.00002
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00819	0.00788	0.00780

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)	-0.00075	-0.00075	-0.00076

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)	0.00075	0.00075	0.00076

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)	-0.00091	-0.00091	-0.00091

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)	0.00091	0.00091	0.00091

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)	-0.00067	-0.00113	-0.00123
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00065	-0.00110	-0.00123

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)	0.00640	0.00611	0.00605
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00608	0.00579	0.00574

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00267	0.00266	0.53388
sky130_osu_sc_12T_ms__nand2_l	0.00205	0.00206	0.39592

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00016	0.00047
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.00010	0.00024

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)	0.06073	1.07121	12.85220
	B->Y (FR)	0.06902	1.04526	12.46030
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.06301	1.08999	12.15130
	B->Y (FR)	0.07355	1.09964	12.14540

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)	0.04879	0.82953	10.00880
	B->Y (RF)	0.05416	0.81566	9.66865
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.05633	0.92410	10.35350
	B->Y (RF)	0.06167	0.91567	10.06750

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	0.00328	0.00324	0.00318
	B	0.00000	0.00000	0.00000
	B	0.00403	0.00395	0.00352
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00243	0.00239	0.00241
	B	0.00000	0.00000	0.00000
	B	0.00294	0.00289	0.00291

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	-0.00031	-0.00038	-0.00041
	B	0.00000	0.00000	0.00000
	B	-0.00029	-0.00036	-0.00038
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00019	-0.00025	-0.00027
	B	0.00000	0.00000	0.00000
	B	-0.00019	-0.00023	-0.00026

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)	-0.00200	-0.00200	-0.00201
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00139	-0.00140	-0.00140

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)	0.00201	0.00206	0.00202
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00140	0.00144	0.00141

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)	-0.00186	-0.00187	-0.00186
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00131	-0.00132	-0.00132

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)	0.00186	0.00187	0.00186
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00131	0.00133	0.00132

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00261	0.00291	0.26530
sky130_osu_sc_12T_ms__nor2_l	0.00195	0.00218	0.20139

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00016	0.00024
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.00010	0.00012

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)	0.13805	1.36047	12.90960
	B->Y (FR)	0.11863	1.31800	12.74610
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.13997	1.41079	12.49170
	B->Y (FR)	0.12520	1.35761	12.12380

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)	0.03565	0.54489	6.13573
	B->Y (RF)	0.03078	0.53729	6.12021
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.04177	0.59762	6.47451
	B->Y (RF)	0.03688	0.59102	6.46060

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	0.00404	0.00396	0.00385
	B	0.00000	0.00000	0.00000
	B	0.00341	0.00330	0.00267
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00291	0.00286	0.00284
	B	0.00000	0.00000	0.00000
	B	0.00252	0.00244	0.00242

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	0.00027	0.00013	0.00006
	B	0.00000	0.00000	0.00000
	B	-0.00040	-0.00042	-0.00051
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00022	0.00013	0.00008
	B	0.00000	0.00000	0.00000
	B	-0.00025	-0.00026	-0.00033

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)	-0.00163	-0.00172	-0.00171
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00108	-0.00115	-0.00115

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)	0.00170	0.00172	0.00171
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00115	0.00116	0.00115

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00098	-0.00099	-0.00098
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00066	-0.00067	-0.00067

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)	0.00101	0.00102	0.00099
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00069	0.00070	0.00068

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00265	0.00273	0.00235	0.26755

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.00015	0.00036

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)	0.16364	1.37082	12.88420
	A1->Y (FR)	0.18979	1.42156	13.04740
	B0->Y (FR)	0.07922	0.95745	9.97658

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)	0.06411	0.67931	7.05170
	A1->Y (RF)	0.07359	0.67794	6.98857
	B0->Y (RF)	0.05258	0.69307	7.54209

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	0.00449	0.00434	0.00394
	A1	0.00000	0.00000	0.00000
	A1	0.00519	0.00509	0.00504
	B0	0.00355	0.00345	0.00344

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	0.00020	0.00017	0.00010
	A1	0.00000	0.00000	0.00000
	A1	0.00091	0.00077	0.00071
	B0	0.00126	0.00119	0.00112

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)	-0.00099	-0.00099	-0.00098
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00169	-0.00174	-0.00174
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00177	-0.00179	-0.00178

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)	0.00102	0.00103	0.00099
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00174	0.00174	0.00174
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00179	0.00179	0.00179

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)	-0.00157	-0.00165	-0.00165
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00166	-0.00173	-0.00172
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00175	-0.00176	-0.00176

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)	0.00164	0.00166	0.00165
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00172	0.00174	0.00172
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00176	0.00177	0.00176

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)	-0.00147	-0.00148	-0.00150

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)	0.00150	0.00151	0.00151

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00247	0.00261	0.00281	0.00276	0.27762

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00026	0.00047

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)	0.18779	1.41488	13.09620
	A1->Y (FR)	0.18227	1.38270	12.95720
	B0->Y (FR)	0.12358	1.32538	12.89320
	B1->Y (FR)	0.14774	1.37023	13.04420

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)	0.09447	0.72559	7.22330
	A1->Y (RF)	0.07934	0.70665	7.18622
	B0->Y (RF)	0.06861	0.72024	7.67815
	B1->Y (RF)	0.08470	0.73896	7.72842

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	0.00644	0.00636	0.00537
	A1	0.00573	0.00552	0.00535
	B0	0.00428	0.00419	0.00359
	B1	0.00503	0.00496	0.00488

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00128	0.00115	0.00108
	A1	0.00063	0.00060	0.00051
	B0	0.00062	0.00058	0.00048
	B1	0.00129	0.00113	0.00106

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)	-0.00160	-0.00168	-0.00167
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00160	-0.00168	-0.00167
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00161	-0.00168	-0.00167
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00171	-0.00171	-0.00170

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)	0.00166	0.00168	0.00167
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00166	0.00168	0.00167
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00166	0.00168	0.00167
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00171	0.00172	0.00171

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)	-0.00095	-0.00096	-0.00096
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00095	-0.00097	-0.00096
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00160	-0.00167	-0.00166
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00170	-0.00170	-0.00170

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)	0.00099	0.00100	0.00097
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00099	0.00100	0.00097
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00165	0.00167	0.00166
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00170	0.00170	0.00170

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)	-0.00096	-0.00098	-0.00096
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00096	-0.00098	-0.00096
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00190	-0.00197	-0.00196
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00193	-0.00196	-0.00199

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)	0.00100	0.00101	0.00098
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00100	0.00101	0.00098
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00195	0.00197	0.00196
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00199	0.00200	0.00200

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)	-0.00158	-0.00167	-0.00166
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00158	-0.00167	-0.00166
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00194	-0.00201	-0.00200
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00197	-0.00199	-0.00203

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)	0.00165	0.00168	0.00166
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00165	0.00168	0.00166
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00200	0.00202	0.00200
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00203	0.00206	0.00204

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00297	0.00275	0.53430
sky130_osu_sc_12T_ms__or2_2	0.00297	0.00275	1.09819
sky130_osu_sc_12T_ms__or2_4	0.00295	0.00275	2.19280
sky130_osu_sc_12T_ms__or2_8	0.00296	0.00275	4.29487
sky130_osu_sc_12T_ms__or2_l	0.00221	0.00207	0.40815

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00026	0.00034
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00036	0.00058
sky130_osu_sc_12T_ms__or2_4	0.00000	0.00055	0.00105
sky130_osu_sc_12T_ms__or2_8	0.00000	0.00094	0.00200
sky130_osu_sc_12T_ms__or2_l	0.00000	0.00017	0.00022

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)	0.11509	1.00873	8.88889
	B->Y (RR)	0.10641	0.98397	8.73702
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.11875	0.88327	9.08782
	B->Y (RR)	0.10937	0.86353	8.96955
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.15381	0.84680	9.52529
	B->Y (RR)	0.14422	0.83105	9.43791
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.22457	0.87616	10.04210
	B->Y (RR)	0.21475	0.86471	9.95387
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.12282	1.07562	8.84258
	B->Y (RR)	0.11342	1.05120	8.67510

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)	0.26910	0.92404	7.16228
	B->Y (FF)	0.23540	0.87329	6.71352
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.33598	0.96920	7.59527
	B->Y (FF)	0.30262	0.91804	7.20680
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.49211	1.12653	8.24350
	B->Y (FF)	0.45833	1.07429	7.93379
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.80341	1.46617	9.02639
	B->Y (FF)	0.76973	1.41181	8.82810
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.27167	0.98194	7.22910
	B->Y (FF)	0.24142	0.92619	6.60765

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	0.00320	0.00283	0.00268
	B	0.00000	0.00000	0.00000
	B	0.00253	0.00223	0.00210
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00536	0.00517	0.00507
	B	0.00000	0.00000	0.00000
	B	0.00467	0.00459	0.00454
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01029	0.01044	0.01048
	B	0.00000	0.00000	0.00000
	B	0.00959	0.00991	0.01006
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02007	0.02086	0.02113
	B	0.00000	0.00000	0.00000
	B	0.01934	0.02032	0.02074
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00244	0.00219	0.00209
	B	0.00000	0.00000	0.00000
	B	0.00197	0.00176	0.00167

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	0.00703	0.00684	0.00679
	B	0.00000	0.00000	0.00000
	B	0.00608	0.00598	0.00596
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00852	0.00869	0.00863
	B	0.00000	0.00000	0.00000
	B	0.00757	0.00779	0.00776
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01224	0.01300	0.01311
	B	0.00000	0.00000	0.00000
	B	0.01130	0.01209	0.01220
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01967	0.02133	0.02212
	B	0.00000	0.00000	0.00000
	B	0.01873	0.02036	0.02116
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00518	0.00506	0.00501
	B	0.00000	0.00000	0.00000
	B	0.00453	0.00446	0.00447

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)	-0.00165	-0.00173	-0.00173
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00165	-0.00172	-0.00173
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00165	-0.00172	-0.00173
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00165	-0.00172	-0.00173
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00110	-0.00116	-0.00116

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)	0.00172	0.00173	0.00173
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00172	0.00172	0.00173
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00172	0.00172	0.00173
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00172	0.00172	0.00173
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00115	0.00116	0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00098	-0.00099	-0.00098
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00099	-0.00099	-0.00098
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00098	-0.00099	-0.00098
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00097	-0.00099	-0.00098
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00066	-0.00066	-0.00065

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)	0.00102	0.00103	0.00099
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00102	0.00103	0.00099
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00102	0.00103	0.00099
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00102	0.00103	0.00099
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00068	0.00069	0.00066

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00288	0.00375	0.27195
sky130_osu_sc_12T_ms__tbufi_l	0.00219	0.00282	0.20503

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00018	0.00047
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.00012	0.00024

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)	0.10945	1.30005	12.72390
	OE->Y (FR)	0.08876	0.45317	4.68806
	OE->Y (RR)	0.15518	1.22874	8.90754
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.11993	1.36430	12.25330
	OE->Y (FR)	0.08492	0.41594	4.68808
	OE->Y (RR)	0.16495	1.33152	8.92867

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)	0.04739	0.67181	7.39171
	OE->Y (FF)	0.08969	0.45313	4.68816
	OE->Y (RF)	0.04498	0.64846	7.00398
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.05545	0.74129	7.66451
	OE->Y (FF)	0.08530	0.41929	4.68809
	OE->Y (RF)	0.05172	0.72114	7.32649

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	0.00316	0.00306	0.00235
	OE	0.00000	0.00000	0.00000
	OE	0.00285	0.00244	0.00235
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00236	0.00228	0.00225
	OE	0.00000	0.00000	0.00000
	OE	0.00209	0.00179	0.00173

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	-0.00040	-0.00043	-0.00051
	OE	0.00000	0.00000	0.00000
	OE	0.00193	0.00153	0.00142
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00024	-0.00025	-0.00032
	OE	0.00000	0.00000	0.00000
	OE	0.00135	0.00105	0.00097

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)	-0.00154	-0.00156	-0.00154
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00143	-0.00144	-0.00143
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00109	-0.00111	-0.00109
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00101	-0.00102	-0.00101

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)	0.00154	0.00156	0.00154
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00146	0.00148	0.00145
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00109	0.00111	0.00109
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00104	0.00104	0.00102

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)	0.00110	0.00068	0.00058
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00097	0.00056	0.00046
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00077	0.00046	0.00039
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00066	0.00037	0.00028

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)	0.00371	0.00337	0.00332
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00385	0.00351	0.00341
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00278	0.00254	0.00254
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00289	0.00264	0.00261

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00288	0.00424	0.27513
sky130_osu_sc_12T_ms__tnbufi_l	0.00209	0.00318	0.20289

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00024	0.00029
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.00015	0.00017

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)	0.11045	1.30594	12.80820
	OE->Y (RR)	0.03616	0.32595	4.68841
	OE->Y (FR)	0.12123	1.34068	12.94790
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.11758	1.35496	12.17380
	OE->Y (RR)	0.04182	0.32570	4.68809
	OE->Y (FR)	0.12704	1.40404	12.54210

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)	0.04626	0.67356	7.42685
	OE->Y (RF)	0.03567	0.32593	4.68838
	OE->Y (FF)	0.10692	0.76131	5.92459
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.05252	0.73492	7.62932
	OE->Y (RF)	0.04163	0.32569	4.68809
	OE->Y (FF)	0.11594	0.79738	5.57522

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	0.00328	0.00318	0.00244
	OE	0.00000	0.00000	0.00000
	OE	0.00752	0.00730	0.00704
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00242	0.00235	0.00231
	OE	0.00000	0.00000	0.00000
	OE	0.00567	0.00548	0.00556

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	-0.00056	-0.00057	-0.00066
	OE	0.00000	0.00000	0.00000
	OE	0.00668	0.00648	0.00645
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00041	-0.00048
	OE	0.00000	0.00000	0.00000
	OE	0.00503	0.00485	0.00488

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)	-0.00128	-0.00130	-0.00128
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00118	-0.00119	-0.00118
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00086	-0.00086	-0.00086
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00079	-0.00080	-0.00079

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)	0.00128	0.00130	0.00128
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00121	0.00122	0.00119
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00086	0.00086	0.00086
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00081	0.00082	0.00080

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)	-0.00200	-0.00250	-0.00262
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00190	-0.00245	-0.00258
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00133	-0.00174	-0.00181
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00128	-0.00169	-0.00180

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)	0.00575	0.00552	0.00553
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00567	0.00545	0.00543
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00437	0.00418	0.00422
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00432	0.00414	0.00417

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00575	0.00485	0.27935

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.00051	0.00076

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	0.20152	1.29528	9.22495
	A->Y (FR)	!B	0.14657	1.34769	12.91170
	B->Y (RR)	A	0.17132	1.26365	9.15937
	B->Y (FR)	!A	0.16759	1.38608	12.99500

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	0.17232	0.85620	6.36315
	A->Y (RF)	!B	0.06453	0.67088	7.09906
	B->Y (FF)	A	0.15866	0.84425	6.36368
	B->Y (RF)	!A	0.07315	0.68213	7.11256

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	0.00294	0.00247	0.00232
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00798	0.00756	0.00747
	B	A	0.00000	0.00000	0.00000
	B	A	0.00165	0.00126	0.00115
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00813	0.00782	0.00714

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	0.00904	0.00860	0.00844
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00200	0.00158	0.00138
	B	A	0.00000	0.00000	0.00000
	B	A	0.00833	0.00818	0.00811
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00248	0.00199	0.00182

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00576	0.00490	0.26544

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.00051	0.00062

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	0.21639	1.30854	9.12901
	A->Y (FR)	B	0.16897	1.38717	12.91990
	B->Y (RR)	!A	0.17963	1.27931	9.09854
	B->Y (FR)	A	0.18401	1.40771	12.94100

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	0.17315	0.84954	6.25786
	A->Y (RF)	B	0.06302	0.68889	7.34534
	B->Y (FF)	!A	0.16501	0.84182	6.24534
	B->Y (RF)	A	0.06941	0.67234	6.95955

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	0.00899	0.00860	0.00816
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00197	0.00125	0.00106
	B	A	0.00000	0.00000	0.00000
	B	A	0.00901	0.00871	0.00832
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00153	0.00114	0.00101

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00159	0.00100	0.00078
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00958	0.00929	0.00925
	B	A	0.00000	0.00000	0.00000
	B	A	0.00161	0.00108	0.00089
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00846	0.00834	0.00830

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.10537
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	58335.40000	116671.00000
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	-0.00171	0.00857	0.13671

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	1.01641	0.96159	0.18380