sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_MS__ADDFx
SKY130_OSU_SC_15T_MS__ADDHx
SKY130_OSU_SC_15T_MS__AND2x
SKY130_OSU_SC_15T_MS__AOI21
SKY130_OSU_SC_15T_MS__AOI22
SKY130_OSU_SC_15T_MS__BUFx
SKY130_OSU_SC_15T_MS__DFFRx
SKY130_OSU_SC_15T_MS__DFFSRx
SKY130_OSU_SC_15T_MS__DFFSx
SKY130_OSU_SC_15T_MS__DFFx
SKY130_OSU_SC_15T_MS__INVx
SKY130_OSU_SC_15T_MS__MUX2
SKY130_OSU_SC_15T_MS__NAND2x
SKY130_OSU_SC_15T_MS__NOR2x
SKY130_OSU_SC_15T_MS__OAI21
SKY130_OSU_SC_15T_MS__OAI22
SKY130_OSU_SC_15T_MS__OR2x
SKY130_OSU_SC_15T_MS__TBUFIx
SKY130_OSU_SC_15T_MS__TNBUFIx
SKY130_OSU_SC_15T_MS__XNOR2
SKY130_OSU_SC_15T_MS__XOR2
SKY130_OSU_SC_15T_MS_x

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01462	0.01460	0.01150	0.59713	0.24483	0.58338
sky130_osu_sc_15T_ms__addf_l	0.01463	0.01461	0.01149	0.37051	0.24527	0.37423

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.00035	0.00038
sky130_osu_sc_15T_ms__addf_l	0.00000	0.00037	0.00039

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.30877	2.32503	21.93180
	B->CO (RR)	0.29004	2.25730	21.42330
	CI->CO (RR)	0.29514	2.32903	22.20340
	CON->CO (FR)	0.07106	1.19387	12.97470
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.32666	2.25957	18.41620
	B->CO (RR)	0.31054	2.20041	18.19190
	CI->CO (RR)	0.31292	2.26374	18.71430
	CON->CO (FR)	0.09674	1.38295	13.32480

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.73082	4.33052	38.74210
	B->CO (FF)	0.67426	4.19151	37.82710
	CI->CO (FF)	0.66460	4.21594	38.29830
	CON->CO (RF)	0.03669	0.70607	8.09125
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.72637	3.75289	28.45490
	B->CO (FF)	0.67015	3.64103	27.85220
	CI->CO (FF)	0.65992	3.63737	28.01270
	CON->CO (RF)	0.04388	0.76124	8.12226

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (FR)	0.50958	1.93934	13.58600
	B->CON (FR)	0.46081	1.85497	13.33180
	CI->CON (FR)	0.44344	1.82357	13.16480
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.48175	1.91225	13.57710
	B->CON (FR)	0.43424	1.82891	13.30950
	CI->CON (FR)	0.41564	1.79654	13.14860

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (RF)	0.14857	0.79167	6.81052
	B->CON (RF)	0.13940	0.78220	6.93123
	CI->CON (RF)	0.13492	0.79687	7.10860
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.14166	0.78509	6.80673
	B->CON (RF)	0.13294	0.77615	6.92745
	CI->CON (RF)	0.12801	0.79033	7.10483

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-R)	0.98222	4.50096	35.05380
	B->S (-R)	0.95179	4.42257	34.58220
	CI->S (-R)	0.91151	4.37303	34.57190
	CON->S (RR)	0.18100	1.22343	9.74801
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.93917	4.03627	27.80870
	B->S (-R)	0.91022	3.97445	27.52970
	CI->S (-R)	0.86807	3.91305	27.34720
	CON->S (RR)	0.19497	1.37226	9.83709

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-F)	0.61836	2.23109	16.18940
	B->S (-F)	0.67118	2.19708	15.86160
	CI->S (-F)	0.60390	2.22662	16.44220
	CON->S (FF)	0.29205	1.07899	7.87637
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.58459	2.01936	13.28480
	B->S (-F)	0.58998	1.93036	13.10840
	CI->S (-F)	0.56924	2.01522	13.56540
	CON->S (FF)	0.28131	1.11009	7.78348

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00229	0.00222	0.00215
	B	0.00270	0.00273	0.00270
	CI	0.00286	0.00292	0.00286
sky130_osu_sc_15T_ms__addf_l	A	0.00175	0.00164	0.00156
	B	0.00217	0.00215	0.00206
	CI	0.00232	0.00233	0.00227

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00811	0.00811	0.00806
	B	0.00794	0.00801	0.00794
	CI	0.00698	0.00717	0.00709
sky130_osu_sc_15T_ms__addf_l	A	0.00760	0.00757	0.00751
	B	0.00742	0.00747	0.00741
	CI	0.00646	0.00661	0.00654

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00811	0.00808	0.00804
	B	0.00793	0.00799	0.00794
	CI	0.00697	0.00712	0.00705
sky130_osu_sc_15T_ms__addf_l	A	0.00760	0.00755	0.00750
	B	0.00742	0.00745	0.00737
	CI	0.00645	0.00659	0.00651

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00226	0.00221	0.00210
	B	0.00268	0.00271	0.00255
	CI	0.00285	0.00290	0.00280
sky130_osu_sc_15T_ms__addf_l	A	0.00172	0.00163	0.00148
	B	0.00214	0.00213	0.00195
	CI	0.00231	0.00232	0.00221

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00812	0.00811	0.00807
	B	0.00794	0.00802	0.00795
	CI	0.00698	0.00717	0.00709
sky130_osu_sc_15T_ms__addf_l	A	0.00760	0.00758	0.00753
	B	0.00743	0.00748	0.00741
	CI	0.00646	0.00662	0.00655

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01665	0.01676	0.01670
	B	0.01524	0.01508	0.01487
	CI	0.01343	0.01347	0.01338
sky130_osu_sc_15T_ms__addf_l	A	0.01591	0.01586	0.01580
	B	0.01452	0.01428	0.01403
	CI	0.01271	0.01266	0.01258

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	**B**	**CO**	**CON**	**S**
sky130_osu_sc_15T_ms__addh_1	0.00723	0.00791	0.59503	0.25840	0.59601
sky130_osu_sc_15T_ms__addh_l	0.00723	0.00792	0.37779	0.25987	0.38044

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__addh_1	0.00000	0.00029	0.00033
sky130_osu_sc_15T_ms__addh_l	0.00000	0.00031	0.00035

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.22443	1.26048	9.75572
	B->CO (RR)	0.22926	1.25484	9.91724
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.24111	1.40929	9.83406
	B->CO (RR)	0.24592	1.40545	10.00010

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (FF)	0.24149	0.99310	7.84040
	B->CO (FF)	0.25412	1.00725	7.89649
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.23415	0.97335	7.28942
	B->CO (FF)	0.24654	0.98739	7.34855

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (RR)	B	0.31737	1.06822	5.91682
	A->CON (FR)	!B	0.30773	1.67789	13.11770
	B->CON (RR)	A	0.32233	1.06161	6.07279
	B->CON (FR)	!A	0.35718	1.77372	13.55040
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.29150	1.03890	5.83267
	A->CON (FR)	!B	0.28023	1.65333	13.13100
	B->CON (RR)	A	0.29624	1.03402	6.00052
	B->CON (FR)	!A	0.32968	1.74886	13.56410

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (FF)	B	0.32093	1.06578	7.25676
	A->CON (RF)	!B	0.09298	0.75593	7.12415
	B->CON (FF)	A	0.32889	1.08958	7.41278
	B->CON (RF)	!A	0.10651	0.75789	7.01959
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.29436	1.03768	7.14996
	A->CON (RF)	!B	0.08633	0.74989	7.13061
	B->CON (FF)	A	0.30225	1.06183	7.31259
	B->CON (RF)	!A	0.09998	0.75226	7.02532

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (RR)	!B	0.23106	2.22379	21.83880
	A->S (FR)	B	0.46123	2.51419	21.68860
	B->S (RR)	!A	0.24376	2.19013	21.33140
	B->S (FR)	A	0.47165	2.57781	22.26990
	CON->S (FR)	-	0.07405	1.20814	13.09420
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.24177	2.15870	18.59620
	A->S (FR)	B	0.45270	2.43353	18.41160
	B->S (RR)	!A	0.25487	2.13517	18.27700
	B->S (FR)	A	0.46247	2.48458	18.80940
	CON->S (FR)	-	0.09543	1.38448	13.41470

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (FF)	!B	0.48548	3.87557	36.73630
	A->S (RF)	B	0.43043	2.29289	18.59410
	B->S (FF)	!A	0.53530	3.96858	37.20330
	B->S (RF)	A	0.43519	2.28557	18.74730
	CON->S (RF)	-	0.03478	0.69521	7.99960
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.46988	3.34852	27.51920
	A->S (RF)	B	0.41222	2.05559	14.15800
	B->S (FF)	!A	0.51995	3.44807	27.96860
	B->S (RF)	A	0.41700	2.05051	14.35170
	CON->S (RF)	-	0.04165	0.75669	8.13976

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00366	0.00353	0.00336
	B	0.00000	0.00000	0.00000
	B	0.00343	0.00330	0.00313
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00314	0.00297	0.00284
	B	0.00000	0.00000	0.00000
	B	0.00292	0.00275	0.00262

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00566	0.00551	0.00518
	B	0.00000	0.00000	0.00000
	B	0.00589	0.00589	0.00558
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00516	0.00499	0.00474
	B	0.00000	0.00000	0.00000
	B	0.00539	0.00536	0.00514

Internal switching power(pJ) to CON rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00366	0.00352	0.00345
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00500	0.00498	0.00492
	B	A	0.00000	0.00000	0.00000
	B	A	0.00343	0.00329	0.00315
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00539	0.00535	0.00533
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00314	0.00297	0.00283
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00465	0.00461	0.00455
	B	A	0.00000	0.00000	0.00000
	B	A	0.00291	0.00275	0.00261
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00504	0.00498	0.00495

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00566	0.00553	0.00539
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00085	0.00085	0.00065
	B	A	0.00000	0.00000	0.00000
	B	A	0.00590	0.00589	0.00581
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00136	0.00130	0.00102
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00515	0.00500	0.00480
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00038	0.00037	0.00021
	B	A	0.00000	0.00000	0.00000
	B	A	0.00539	0.00536	0.00522
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00089	0.00082	0.00067

Internal switching power(pJ) to S rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00567	0.00552	0.00540
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00085	0.00088	0.00084
	B	A	0.00000	0.00000	0.00000
	B	A	0.00590	0.00590	0.00582
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00138	0.00132	0.00128
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00517	0.00500	0.00490
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00039	0.00038	0.00034
	B	A	0.00000	0.00000	0.00000
	B	A	0.00539	0.00536	0.00531
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00091	0.00084	0.00079

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00366	0.00352	0.00336
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00500	0.00500	0.00499
	B	A	0.00000	0.00000	0.00000
	B	A	0.00343	0.00330	0.00319
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00538	0.00537	0.00537
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00314	0.00297	0.00286
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00464	0.00462	0.00460
	B	A	0.00000	0.00000	0.00000
	B	A	0.00291	0.00275	0.00265
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00503	0.00499	0.00496

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	**B**	**Y**
sky130_osu_sc_15T_ms__and2_1	0.00386	0.00394	0.59650
sky130_osu_sc_15T_ms__and2_2	0.00386	0.00394	1.18385
sky130_osu_sc_15T_ms__and2_4	0.00386	0.00394	2.32445
sky130_osu_sc_15T_ms__and2_6	0.00389	0.00394	3.41076
sky130_osu_sc_15T_ms__and2_8	0.00387	0.00394	4.47860
sky130_osu_sc_15T_ms__and2_l	0.00289	0.00298	0.36996

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.00013	0.00017
sky130_osu_sc_15T_ms__and2_2	0.00000	0.00018	0.00021
sky130_osu_sc_15T_ms__and2_4	0.00000	0.00030	0.00032
sky130_osu_sc_15T_ms__and2_6	0.00000	0.00042	0.00045
sky130_osu_sc_15T_ms__and2_8	0.00000	0.00054	0.00058
sky130_osu_sc_15T_ms__and2_l	0.00000	0.00015	0.00020

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.17141	1.17271	9.34591
	B->Y (RR)	0.17901	1.17820	9.55398
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.19369	1.07259	9.66486
	B->Y (RR)	0.20122	1.06982	9.82604
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.26947	1.07361	10.22090
	B->Y (RR)	0.27699	1.06535	10.33620
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.34568	1.11665	10.54870
	B->Y (RR)	0.35283	1.10749	10.61770
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.42009	1.17844	10.88760
	B->Y (RR)	0.42741	1.17186	10.91440
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.22551	1.40497	9.93991
	B->Y (RR)	0.23416	1.40600	10.13490

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (FF)	0.17682	0.90147	7.35658
	B->Y (FF)	0.18952	0.92040	7.45759
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.22007	0.91007	7.68747
	B->Y (FF)	0.23345	0.92524	7.76728
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.32507	1.00315	8.22134
	B->Y (FF)	0.33753	1.01649	8.27712
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.43205	1.11339	8.58072
	B->Y (FF)	0.44367	1.12610	8.62204
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.53389	1.22288	8.85311
	B->Y (FF)	0.54500	1.23549	8.89725
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.21477	0.99411	7.53246
	B->Y (FF)	0.23200	1.01146	7.64358

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00292	0.00264	0.00256
	B	0.00000	0.00000	0.00000
	B	0.00297	0.00270	0.00259
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00555	0.00547	0.00539
	B	0.00000	0.00000	0.00000
	B	0.00560	0.00556	0.00544
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01143	0.01163	0.01174
	B	0.00000	0.00000	0.00000
	B	0.01149	0.01178	0.01180
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01729	0.01753	0.01827
	B	0.00000	0.00000	0.00000
	B	0.01733	0.01804	0.01833
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02311	0.02386	0.02476
	B	0.00000	0.00000	0.00000
	B	0.02314	0.02399	0.02486
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00210	0.00191	0.00214
	B	0.00000	0.00000	0.00000
	B	0.00216	0.00197	0.00186

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00702	0.00683	0.00675
	B	0.00000	0.00000	0.00000
	B	0.00784	0.00769	0.00760
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00880	0.00899	0.00891
	B	0.00000	0.00000	0.00000
	B	0.00965	0.00982	0.00972
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01324	0.01411	0.01413
	B	0.00000	0.00000	0.00000
	B	0.01408	0.01489	0.01491
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01776	0.01927	0.01948
	B	0.00000	0.00000	0.00000
	B	0.01860	0.01999	0.02020
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02207	0.02416	0.02466
	B	0.00000	0.00000	0.00000
	B	0.02291	0.02486	0.02529
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00528	0.00514	0.00506
	B	0.00000	0.00000	0.00000
	B	0.00585	0.00569	0.00562

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00245	-0.00248	-0.00247
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00245	-0.00247	-0.00247
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00245	-0.00247	-0.00247
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00247	-0.00249	-0.00249
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00245	-0.00246	-0.00247
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00171	-0.00173	-0.00173

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00246	0.00249	0.00248
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00246	0.00249	0.00248
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00246	0.00249	0.00248
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00248	0.00250	0.00250
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00246	0.00249	0.00248
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00173	0.00174	0.00173

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00233	-0.00233	-0.00233
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00233	-0.00234	-0.00233
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00233	-0.00234	-0.00233
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00233	-0.00233	-0.00233
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00233	-0.00234	-0.00233
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00163	-0.00164	-0.00164

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00235	0.00234
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00237	0.00234
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00237	0.00234
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00237	0.00234
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00233	0.00237	0.00234
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00164	0.00164	0.00164

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00357	0.00377	0.00366	0.24923

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.00008	0.00011

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.26272	1.72494	13.61130
	A1->Y (FR)	0.22256	1.64300	13.32440
	B0->Y (FR)	0.20811	1.61844	13.19490

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (RF)	0.07448	0.70716	6.67305
	A1->Y (RF)	0.06764	0.71075	6.88868
	B0->Y (RF)	0.05110	0.70251	7.16268

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00557	0.00549	0.00548
	A1	0.00000	0.00000	0.00000
	A1	0.00472	0.00461	0.00459
	B0	0.00471	0.00460	0.00454

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00078	0.00064	0.00053
	A1	0.00000	0.00000	0.00000
	A1	0.00080	0.00064	0.00053
	B0	-0.00054	-0.00053	-0.00062

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00204	-0.00211	-0.00209
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00214	-0.00214	-0.00215
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00215	-0.00215	-0.00215

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00209	0.00212	0.00209
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00215	0.00219	0.00216
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00215	0.00219	0.00216

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00201	-0.00208	-0.00206
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00210	-0.00212	-0.00211
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00229	-0.00230	-0.00231

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00204	0.00208	0.00206
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00210	0.00212	0.00212
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00231	0.00233	0.00232

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00131	-0.00131	-0.00131

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00142	0.00143	0.00134

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__aoi22_l	0.00356	0.00374	0.00392	0.00370	0.24899

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.00011	0.00015

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.32768	1.78295	13.57660
	A1->Y (FR)	0.29201	1.73320	13.47660
	B0->Y (FR)	0.21649	1.60207	13.03190
	B1->Y (FR)	0.25186	1.65188	13.14940

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (RF)	0.09280	0.72730	6.69691
	A1->Y (RF)	0.08591	0.73304	6.91381
	B0->Y (RF)	0.05859	0.69866	6.86630
	B1->Y (RF)	0.06486	0.69297	6.65194

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00684	0.00676	0.00673
	A1	0.00601	0.00588	0.00582
	B0	0.00507	0.00489	0.00482
	B1	0.00586	0.00573	0.00566

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00182	0.00169	0.00155
	A1	0.00183	0.00170	0.00156
	B0	-0.00034	-0.00034	-0.00041
	B1	-0.00033	-0.00033	-0.00040

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00204	-0.00211	-0.00209
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00215	-0.00216	-0.00215
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00214	-0.00216	-0.00215
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00214	-0.00216	-0.00215

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00209	0.00211	0.00209
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00215	0.00219	0.00216
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00215	0.00219	0.00216
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00215	0.00219	0.00216

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00201	-0.00207	-0.00205
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00210	-0.00212	-0.00211
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00228	-0.00229	-0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00228	-0.00229	-0.00231

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00204	0.00208	0.00205
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00211	0.00212	0.00212
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00230	0.00232	0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00230	0.00232	0.00231

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00131	-0.00132	-0.00131
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00131	-0.00131	-0.00131
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00237	-0.00239	-0.00240
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00237	-0.00239	-0.00240

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00146	0.00147	0.00135
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00131	0.00131	0.00131
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00239	0.00243	0.00240
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00239	0.00243	0.00240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00132	-0.00133	-0.00132
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00132	-0.00133	-0.00132
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00219	-0.00220	-0.00220
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00219	-0.00220	-0.00220

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00147	0.00148	0.00136
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00132	0.00133	0.00132
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00219	0.00223	0.00220
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00219	0.00223	0.00220

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__buf_1	7.93650
sky130_osu_sc_15T_ms__buf_2	10.37850
sky130_osu_sc_15T_ms__buf_4	15.26250
sky130_osu_sc_15T_ms__buf_6	20.14650
sky130_osu_sc_15T_ms__buf_8	25.03050
sky130_osu_sc_15T_ms__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00396	0.58920
sky130_osu_sc_15T_ms__buf_2	0.00399	1.17809
sky130_osu_sc_15T_ms__buf_4	0.00398	2.30178
sky130_osu_sc_15T_ms__buf_6	0.00092	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00399	4.55436
sky130_osu_sc_15T_ms__buf_l	0.00303	0.36910

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.00011	0.00011
sky130_osu_sc_15T_ms__buf_2	0.00000	0.00016	0.00017
sky130_osu_sc_15T_ms__buf_4	0.00000	0.00026	0.00030
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.00048	0.00056
sky130_osu_sc_15T_ms__buf_l	0.00000	0.00012	0.00012

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (RR)**	0.12590	1.11845	9.22766
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.13587	1.00673	9.52928
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.18282	0.97632	9.97018
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.27747	1.02738	10.68180
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.16250	1.33321	9.76402

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (FF)**	0.16833	0.89023	7.27550
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.21411	0.91119	7.77974
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.32022	1.00486	8.34293
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.53046	1.22840	9.08752
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.20829	0.98338	7.48482

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00277	0.00243	0.00232
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00542	0.00519	0.00510
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01133	0.01147	0.01135
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02303	0.02364	0.02430
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00209	0.00182	0.00169

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00688	0.00666	0.00658
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00869	0.00880	0.00871
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01316	0.01392	0.01392
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02207	0.02400	0.02441
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00524	0.00503	0.00496

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00046	-0.00046	-0.00046

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00046	0.00046	0.00046

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00367	0.00372	0.01147	0.56842	0.57406
sky130_osu_sc_15T_ms__dffr_l	0.00367	0.00372	0.01146	0.36926	0.37148

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.00059	0.00065
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.00060	0.00066

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	1.01208	2.59635	15.33220
	QN->Q (FR)	0.08371	1.31511	14.01500
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	1.00609	2.81677	15.62200
	QN->Q (FR)	0.10277	1.45500	13.92480

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RF)	0.86312	2.73665	18.83940
	QN->Q (RF)	0.04129	0.75444	8.59404
	RN->Q (FF)	0.59366	2.59222	20.86590
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.90606	3.08482	19.17190
	QN->Q (RF)	0.04705	0.80440	8.53923
	RN->Q (FF)	0.63811	2.94015	21.19080

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->QN (RR)	0.76157	1.79780	10.25700
	RN->QN (FR)	0.49171	1.65197	12.28480
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.77804	1.94956	10.38860
	RN->QN (FR)	0.50836	1.80593	12.41150

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	**CK->QN (RF)**	0.87095	1.55008	5.88660
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.83767	1.53988	5.80165

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.12713	-0.15598	-0.87552
	setup	CK (R)	0.78326	0.77318	1.65989
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.12848	-0.15661	-0.87518
	setup	CK (R)	0.78579	0.77340	1.63172

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.40147	-0.81945	-9.72860
	setup	CK (R)	0.46571	0.85596	9.83194
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.40218	-0.81846	-9.72838
	setup	CK (R)	0.46435	0.85603	9.83086

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.12713	-0.15598	-0.87552
	setup	CK (R)	0.78326	0.77318	1.65989
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.12848	-0.15661	-0.87518
	setup	CK (R)	0.78579	0.77340	1.63172

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.40147	-0.81945	-9.72860
	setup	CK (R)	0.46571	0.85596	9.83194
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.40218	-0.81846	-9.72838
	setup	CK (R)	0.46435	0.85603	9.83086

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.72099	0.71657	1.38352
	removal	CK (R)	-0.12728	-0.14896	-0.13250
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.71801	0.71387	1.38297
	removal	CK (R)	-0.12728	-0.14896	-0.13250

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.72099	0.71657	1.38352
	removal	CK (R)	-0.12728	-0.14896	-0.13250
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.71801	0.71387	1.38297
	removal	CK (R)	-0.12728	-0.14896	-0.13250

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	RN ()	0.37534	0.73303	13.33370
	min_pulse_width	RN ()	0.37257	0.73303	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.37594	0.72869	13.33370
	min_pulse_width	RN ()	0.37319	0.72869	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.45311	0.55488	13.33370
	min_pulse_width	CK ()	0.49698	0.55054	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.40634	0.55054	13.33370
	min_pulse_width	CK ()	0.48256	0.55054	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.99132	1.03068	13.33370
	min_pulse_width	CK ()	0.38977	0.73955	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.98947	1.03285	13.33370
	min_pulse_width	CK ()	0.38697	0.73955	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00668	0.00601	0.00149
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00583	0.00529	0.00320

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00759	0.00718	0.00493
	RN	-0.00097	-0.02993	-0.29467
	RN	0.01713	0.01680	0.01432
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00672	0.00639	0.00526
	RN	-0.00097	-0.02311	-0.19143
	RN	0.01625	0.01599	0.01466

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00760	0.00719	0.00488
	RN	-0.00097	-0.03011	-0.29759
	RN	0.01713	0.01680	0.01433
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00673	0.00639	0.00525
	RN	-0.00097	-0.02319	-0.19257
	RN	0.01625	0.01599	0.01465

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00666	0.00599	0.00117
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00581	0.00526	0.00297

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00200	-0.00209	-0.00208
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00755	0.00727	0.00703
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00310	0.00286	0.00265
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00200	-0.00209	-0.00208
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00755	0.00727	0.00703
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00310	0.00286	0.00265

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00206	0.00209	0.00208
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01258	0.01240	0.01222
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00596	0.00578	0.00575
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00206	0.00209	0.00208
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01258	0.01240	0.01222
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00596	0.00579	0.00575

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00257	0.00225	0.00206
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00738	0.00691	0.00660
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00257	0.00225	0.00206
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00738	0.00691	0.00660

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00636	0.00610	0.00605
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01307	0.01269	0.01242
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00636	0.00609	0.00604
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01306	0.01268	0.01242

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00046	-0.00083	-0.00108
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00370	0.00308	0.00253
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00067	-0.00107	-0.00131
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00046	-0.00083	-0.00108
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00370	0.00308	0.00253
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00067	-0.00107	-0.00131

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01046	0.01015	0.00998
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02038	0.01988	0.01926
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01554	0.01520	0.01476
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02059	0.02000	0.01957
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01111	0.01078	0.01068
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01046	0.01015	0.00998
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02038	0.01988	0.01926
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01554	0.01520	0.01476
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02059	0.02000	0.01957
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01111	0.01079	0.01068

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_15T_ms__dffsr_1	0.00363	0.00373	0.00816	0.01172	0.59749	0.60017
sky130_osu_sc_15T_ms__dffsr_l	0.00363	0.00373	0.00815	0.01172	0.36826	0.37078

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.00060	0.00069
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.00061	0.00071

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.93023	2.50951	15.60050
	QN->Q (FR)	0.07537	1.24323	13.52120
	RN->Q (RR)	0.76515	2.36006	15.60020
	SN->Q (FR)	0.73916	2.44087	18.39990
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.95159	2.76225	15.66510
	QN->Q (FR)	0.10275	1.44985	13.89120
	RN->Q (RR)	0.78986	2.61281	15.65400
	SN->Q (FR)	0.76405	2.69753	18.42600

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RF)	0.93535	2.79889	19.04340
	QN->Q (RF)	0.04089	0.76450	8.76053
	RN->Q (FF)	0.63205	2.61116	21.12330
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.99201	3.17387	19.21500
	QN->Q (RF)	0.04694	0.80311	8.52707
	RN->Q (FF)	0.69019	2.98632	21.29010

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RR)	0.83559	1.85843	10.24470
	RN->QN (FR)	0.53281	1.67172	12.33270
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.86223	2.04083	10.46660
	RN->QN (FR)	0.55997	1.85425	12.54610

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RF)	0.80386	1.48364	6.06554
	RN->QN (RF)	0.63840	1.33817	6.05966
	SN->QN (FF)	0.61729	1.42402	8.85048
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.79217	1.49269	5.87520
	RN->QN (RF)	0.62728	1.34768	5.86727
	SN->QN (FF)	0.60377	1.43164	8.62841

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.13916	-0.16610	-0.98236
	setup	CK (R)	0.70343	0.68946	1.54646
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13717	-0.16519	-0.98186
	setup	CK (R)	0.70070	0.68432	1.53957

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.45419	-0.86223	-9.92815
	setup	CK (R)	0.52781	0.89403	9.98667
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.45323	-0.86024	-9.92689
	setup	CK (R)	0.52522	0.89146	9.98226

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.13916	-0.16610	-0.98236
	setup	CK (R)	0.70343	0.68946	1.54646
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13717	-0.16519	-0.98186
	setup	CK (R)	0.70070	0.68432	1.53957

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.45419	-0.86223	-9.92815
	setup	CK (R)	0.52781	0.89403	9.98667
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.45323	-0.86024	-9.92689
	setup	CK (R)	0.52522	0.89146	9.98226

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.59010	0.58496	1.23190
	removal	CK (R)	-0.06199	-0.07495	-0.10361
	hold	SN (R)	-0.61237	-0.91470	-7.97253
	setup	SN (R)	0.64048	0.96962	9.12376
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.58881	0.58005	1.22695
	removal	CK (R)	-0.06199	-0.07495	-0.10580
	hold	SN (R)	-0.57422	-0.88458	-7.90978
	setup	SN (R)	0.63688	0.95745	9.06347

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.59010	0.58496	1.23190
	removal	CK (R)	-0.06199	-0.07495	-0.10361
	hold	SN (R)	-0.61769	-0.91470	-7.97253
	hold	SN (R)	-0.61237	-0.91470	-7.98071
	setup	SN (R)	0.64048	0.96455	9.09262
	setup	SN (R)	0.63216	0.96962	9.12376
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.58881	0.58005	1.22695
	removal	CK (R)	-0.06199	-0.07495	-0.10580
	hold	SN (R)	-0.61317	-0.89869	-7.91238
	hold	SN (R)	-0.57422	-0.88458	-7.90978
	setup	SN (R)	0.63688	0.94680	9.01779
	setup	SN (R)	0.59521	0.95745	9.06347

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	RN ()	0.42921	0.76562	13.33370
	min_pulse_width	RN ()	0.43791	0.76562	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.44702	0.76128	13.33370
	min_pulse_width	RN ()	0.44413	0.76128	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.07047	0.09338	0.79804
	removal	CK (R)	-0.01670	-0.05387	-0.58133
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.06917	0.09287	0.77765
	removal	CK (R)	-0.01670	-0.05387	-0.58428

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.07047	0.09338	0.79804
	removal	CK (R)	-0.01670	-0.05387	-0.58133
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.06917	0.09287	0.77765
	removal	CK (R)	-0.01670	-0.05387	-0.58428

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	SN ()	0.61308	0.98506	13.33370
	min_pulse_width	SN ()	0.61065	0.98723	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.60845	0.96550	13.33370
	min_pulse_width	SN ()	0.57670	0.97419	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.39192	0.55054	13.33370
	min_pulse_width	CK ()	0.50934	0.55054	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.37132	0.55054	13.33370
	min_pulse_width	CK ()	0.49904	0.55054	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.91408	0.95029	13.33370
	min_pulse_width	CK ()	0.45528	0.78083	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.90990	0.94595	13.33370
	min_pulse_width	CK ()	0.45109	0.77866	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00810	0.00741	0.00242
	RN	0.01528	0.01474	0.00977
	SN	-0.00097	-0.03084	-0.30974
	SN	0.01645	0.01597	0.01122
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00733	0.00681	0.00475
	RN	0.01451	0.01413	0.01204
	SN	-0.00097	-0.02307	-0.19091
	SN	0.01568	0.01536	0.01342

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00859	0.00835	0.00694
	RN	-0.00097	-0.03084	-0.30974
	RN	0.01791	0.01766	0.01606
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00780	0.00752	0.00641
	RN	-0.00097	-0.02307	-0.19091
	RN	0.01711	0.01682	0.01550

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00860	0.00836	0.00692
	RN	-0.00097	-0.03093	-0.31113
	RN	0.01791	0.01766	0.01605
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00781	0.00753	0.00640
	RN	-0.00097	-0.02317	-0.19221
	RN	0.01711	0.01682	0.01553

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00807	0.00738	0.00214
	RN	0.01525	0.01471	0.00946
	SN	-0.00097	-0.03093	-0.31111
	SN	0.01643	0.01594	0.01099
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00730	0.00678	0.00461
	RN	0.01448	0.01410	0.01191
	SN	-0.00097	-0.02317	-0.19220
	SN	0.01565	0.01533	0.01324

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00202	-0.00209	-0.00208
	(!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)	0.00969	0.00944	0.00922
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00358	0.00335	0.00315
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00357	0.00334	0.00314
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00362	0.00339	0.00318
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00202	-0.00209	-0.00208
	(!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)	0.00969	0.00944	0.00921
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00358	0.00335	0.00315
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00357	0.00334	0.00314
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00362	0.00339	0.00318

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00207	0.00210	0.00208
	(!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)	0.01430	0.01414	0.01385
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00646	0.00630	0.00626
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00648	0.00632	0.00628
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00642	0.00627	0.00623
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00207	0.00210	0.00208
	(!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)	0.01429	0.01413	0.01384
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00645	0.00629	0.00626
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00647	0.00631	0.00627
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00642	0.00626	0.00622

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00276	0.00243	0.00217
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00926	0.00879	0.00836
sky130_osu_sc_15T_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)	0.00276	0.00244	0.00217
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00925	0.00879	0.00836

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00699	0.00672	0.00666
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01396	0.01351	0.01320
sky130_osu_sc_15T_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)	0.00698	0.00671	0.00665
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01395	0.01350	0.01319

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	-0.00486	-0.00490	-0.00490
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00513	-0.00522	-0.00519
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00490	-0.00495	-0.00493
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00263	0.00237	0.00203
sky130_osu_sc_15T_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)	-0.00486	-0.00490	-0.00490
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00512	-0.00521	-0.00517
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00490	-0.00495	-0.00493
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00264	0.00238	0.00204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00490	0.00494	0.00492
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00516	0.00525	0.00519
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00490	0.00497	0.00493
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01043	0.01021	0.01019
sky130_osu_sc_15T_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)	0.00490	0.00494	0.00492
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00515	0.00524	0.00517
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00490	0.00496	0.00493
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01043	0.01020	0.01018

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00047	-0.00083	-0.00108
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00433	0.00376	0.00322
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00428	0.00372	0.00319
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00054	-0.00094	-0.00118
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00310	0.00236	0.00192
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00047	-0.00083	-0.00108
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00432	0.00376	0.00321
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00428	0.00371	0.00319
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00054	-0.00094	-0.00118
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00310	0.00236	0.00192

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02267	0.02219	0.02152
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01050	0.01015	0.01001
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01587	0.01556	0.01516
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01593	0.01563	0.01519
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02226	0.02163	0.02110
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01100	0.01067	0.01058
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01368	0.01309	0.01284
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02267	0.02219	0.02152
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01050	0.01015	0.01001
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01587	0.01556	0.01516
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01593	0.01563	0.01519
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02225	0.02162	0.02109
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01100	0.01067	0.01058
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01367	0.01309	0.01283

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00366	0.00651	0.01140	0.56821	0.56692
sky130_osu_sc_15T_ms__dffs_l	0.00366	0.00650	0.01140	0.36649	0.37098

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.00055	0.00070
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.00057	0.00071

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.63933	2.17840	14.92940
	QN->Q (FR)	0.08389	1.30774	13.97110
	SN->Q (FR)	0.54117	2.21559	17.76600
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.65605	2.42632	15.16650
	QN->Q (FR)	0.10286	1.44735	13.83950
	SN->Q (FR)	0.55665	2.45996	17.97190

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RF)	0.97152	2.84567	18.90990
	QN->Q (RF)	0.04105	0.75536	8.57280
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	1.00632	3.17735	19.13250
	QN->Q (RF)	0.04682	0.79945	8.50495

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RR)	0.86493	1.90145	10.26360
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.87464	2.04960	10.46920

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	**CK->QN (RF)**	0.52053	1.14850	5.48240
	SN->QN (FF)	0.41834	1.18467	8.31865
sky130_osu_sc_15T_ms__dffs_l	**CK->QN (RF)**	0.50898	1.16967	5.45487
	SN->QN (FF)	0.40601	1.20596	8.24996

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.09737	-0.13005	-0.82754
	setup	CK (R)	0.46115	0.44489	1.38803
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.09992	-0.13245	-0.82800
	setup	CK (R)	0.45834	0.44339	1.38487

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.41927	-0.82844	-9.80662
	setup	CK (R)	0.54119	0.87305	9.90151
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.41735	-0.82931	-9.80360
	setup	CK (R)	0.53712	0.87297	9.90114

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.09737	-0.13005	-0.82754
	setup	CK (R)	0.46115	0.44489	1.38803
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.09992	-0.13245	-0.82800
	setup	CK (R)	0.45834	0.44339	1.38487

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.41927	-0.82844	-9.80662
	setup	CK (R)	0.54119	0.87305	9.90151
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.41735	-0.82931	-9.80360
	setup	CK (R)	0.53712	0.87297	9.90114

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.12448	0.15446	1.28784
	removal	CK (R)	-0.04061	-0.09505	-1.05321
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.12270	0.15047	1.27668
	removal	CK (R)	-0.04061	-0.09505	-1.05424

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.12448	0.15446	1.28784
	removal	CK (R)	-0.04061	-0.09505	-1.05321
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.12270	0.15047	1.27668
	removal	CK (R)	-0.04061	-0.09505	-1.05424

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	SN ()	0.39168	0.88077	13.33370
	min_pulse_width	SN ()	0.39981	0.87643	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.38467	0.85687	13.33370
	min_pulse_width	SN ()	0.37437	0.86339	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.22507	0.55054	13.33370
	min_pulse_width	CK ()	0.53406	0.55054	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.21271	0.55054	13.33370
	min_pulse_width	CK ()	0.51758	0.55054	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.66594	0.74172	13.33370
	min_pulse_width	CK ()	0.47164	0.75911	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.66314	0.74172	13.33370
	min_pulse_width	CK ()	0.46876	0.75911	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00667	0.00595	0.00138
	SN	-0.00097	-0.02993	-0.29456
	SN	0.01418	0.01365	0.00916
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00580	0.00525	0.00321
	SN	-0.00097	-0.02300	-0.18999
	SN	0.01331	0.01294	0.01091

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00756	0.00719	0.00499
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00670	0.00639	0.00531

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00757	0.00720	0.00497
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00671	0.00640	0.00528

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00664	0.00592	0.00128
	SN	-0.00097	-0.02989	-0.29388
	SN	0.01416	0.01362	0.00899
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00578	0.00522	0.00309
	SN	-0.00097	-0.02317	-0.19230
	SN	0.01329	0.01291	0.01072

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00205	-0.00213	-0.00212
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00745	0.00718	0.00685
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00303	0.00279	0.00258
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00205	-0.00213	-0.00212
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00745	0.00718	0.00685
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00303	0.00279	0.00258

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00210	0.00213	0.00212
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01258	0.01238	0.01222
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00612	0.00594	0.00591
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00210	0.00213	0.00212
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01258	0.01238	0.01222
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00612	0.00594	0.00591

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00349	-0.00350	-0.00350
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00271	0.00248	0.00229
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00349	-0.00350	-0.00350
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00270	0.00248	0.00229

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00349	0.00353	0.00351
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00743	0.00718	0.00707
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00349	0.00353	0.00351
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00743	0.00718	0.00707

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00048	-0.00084	-0.00110
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00060	-0.00103	-0.00128
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00253	0.00178	0.00134
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00048	-0.00084	-0.00110
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00060	-0.00103	-0.00128
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00253	0.00178	0.00134

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02034	0.01983	0.01921
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01047	0.01014	0.00999
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02052	0.01983	0.01943
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01106	0.01075	0.01063
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01329	0.01269	0.01243
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02034	0.01983	0.01921
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01047	0.01014	0.00999
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02052	0.01983	0.01943
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01106	0.01075	0.01063
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01329	0.01269	0.01243

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00382	0.01125	0.60286	0.60622
sky130_osu_sc_15T_ms__dff_l	0.00382	0.01123	0.35265	0.35353

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.00049	0.00051
sky130_osu_sc_15T_ms__dff_l	0.00000	0.00050	0.00052

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.50418	2.03779	15.19320
	QN->Q (FR)	0.07494	1.24423	13.55790
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.54372	2.31238	14.97710
	QN->Q (FR)	0.11174	1.52001	14.30290

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RF)	0.81348	2.67392	19.02390
	QN->Q (RF)	0.04075	0.76790	8.77401
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.88519	3.07835	18.99590
	QN->Q (RF)	0.04694	0.79272	8.38686

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.71689	1.73481	10.16590
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.75354	1.94250	10.35800

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RF)	0.39779	1.02123	5.58475
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.39853	1.03957	5.26745

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.09721	-0.13087	-0.87215
	setup	CK (R)	0.32472	0.31572	1.34046
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.09675	-0.13087	-0.87313
	setup	CK (R)	0.32117	0.31029	1.30786

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.39836	-0.82770	-9.81906
	setup	CK (R)	0.46762	0.87880	9.94758
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.39869	-0.82917	-9.81978
	setup	CK (R)	0.46723	0.87795	9.94768

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.18181	0.55054	13.33370
	min_pulse_width	CK ()	0.46402	0.55054	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.17563	0.55054	13.33370
	min_pulse_width	CK ()	0.45166	0.55054	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_15T_ms__dff_1	**min_pulse_width**	**CK ()**	0.53068	0.70696	13.33370
	min_pulse_width	**CK ()**	0.38253	0.75911	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.52907	0.70479	13.33370
	min_pulse_width	**CK ()**	0.38253	0.75911	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00709	0.00626	0.00106
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00632	0.00570	0.00369

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00771	0.00746	0.00607
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00693	0.00657	0.00498

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00771	0.00746	0.00604
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00693	0.00657	0.00498

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00706	0.00623	0.00121
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00630	0.00567	0.00358

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00199	-0.00208	-0.00207
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00715	0.00690	0.00661
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00199	-0.00208	-0.00207
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00715	0.00691	0.00661

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00206	0.00209	0.00207
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01317	0.01296	0.01275
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00206	0.00209	0.00207
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01318	0.01296	0.01276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00048	-0.00084	-0.00109
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00063	-0.00100	-0.00126
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00048	-0.00084	-0.00109
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00063	-0.00102	-0.00126

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01041	0.01010	0.00993
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02002	0.01954	0.01892
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02096	0.02026	0.01981
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01099	0.01067	0.01057
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01041	0.01010	0.00993
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02003	0.01955	0.01893
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02096	0.02027	0.01982
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01099	0.01067	0.01057

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__inv_1	5.49450
sky130_osu_sc_15T_ms__inv_10	27.47250
sky130_osu_sc_15T_ms__inv_2	7.93650
sky130_osu_sc_15T_ms__inv_3	10.37850
sky130_osu_sc_15T_ms__inv_4	12.82050
sky130_osu_sc_15T_ms__inv_6	17.70450
sky130_osu_sc_15T_ms__inv_8	22.58850
sky130_osu_sc_15T_ms__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00377	0.58988
sky130_osu_sc_15T_ms__inv_10	0.03469	5.62137
sky130_osu_sc_15T_ms__inv_2	0.00713	1.18657
sky130_osu_sc_15T_ms__inv_3	0.01060	1.71380
sky130_osu_sc_15T_ms__inv_4	0.01399	2.30494
sky130_osu_sc_15T_ms__inv_6	0.02097	3.42340
sky130_osu_sc_15T_ms__inv_8	0.02783	4.52699
sky130_osu_sc_15T_ms__inv_l	0.00279	0.35403

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.00005	0.00006
sky130_osu_sc_15T_ms__inv_10	0.00000	0.00053	0.00064
sky130_osu_sc_15T_ms__inv_2	0.00000	0.00011	0.00013
sky130_osu_sc_15T_ms__inv_3	0.00000	0.00016	0.00019
sky130_osu_sc_15T_ms__inv_4	0.00000	0.00021	0.00026
sky130_osu_sc_15T_ms__inv_6	0.00000	0.00032	0.00039
sky130_osu_sc_15T_ms__inv_8	0.00000	0.00042	0.00051
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00006	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.07319	1.20157	13.01960
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.07925	0.81219	13.04640
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.05389	1.02934	13.03710
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.05698	0.95965	12.98470
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.05525	0.90502	12.98510
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.06002	0.85713	12.99500
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.06859	0.82724	12.99040
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.10192	1.40334	13.33660

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (RF)**	0.03638	0.70311	8.06435
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.04907	0.54351	8.14777
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02953	0.63879	8.09147
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.03182	0.61507	8.14137
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.03129	0.59144	8.13061
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.03672	0.56780	8.15166
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.04255	0.55315	8.15391
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.04320	0.75133	7.99666

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00358	0.00351	0.00351
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03039	0.03038	0.03098
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00630	0.00625	0.00630
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00970	0.00956	0.00968
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01243	0.01162	0.01248
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01847	0.01836	0.01867
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02447	0.02435	0.02484
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00265	0.00259	0.00260

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00062	-0.00066	-0.00068
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01099	-0.01066	-0.00998
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00203	-0.00207	-0.00206
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00264	-0.00274	-0.00267
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00414	-0.00416	-0.00405
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00629	-0.00630	-0.00603
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00855	-0.00853	-0.00801
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00037	-0.00042	-0.00044

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_15T_ms__mux2_1	0.33788	0.33986	0.00772	0.52065

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.00018	0.00019

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.04044	0.78226	8.88560
	A1->Y (RR)	-	0.04716	0.78566	8.90195
	S0->Y (RR)	(!A0 * A1)	0.10477	0.91383	8.13890
	S0->Y (FR)	(A0 * !A1)	0.08414	1.04352	9.83040

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (FF)	-	0.03450	0.64401	7.37301
	A1->Y (FF)	-	0.02983	0.63823	7.35389
	S0->Y (FF)	(!A0 * A1)	0.17294	0.86155	7.13727
	S0->Y (RF)	(A0 * !A1)	0.04041	0.68296	7.24953

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00354	-0.00354	-0.00354
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00243	-0.00243	-0.00244
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00475	0.00449	0.00438
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00225	-0.00263	-0.00281

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00354	0.00354	0.00354
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00243	0.00243	0.00244
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00072	0.00034	0.00018
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00937	0.00910	0.00900

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00095	-0.00094	-0.00095

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00095	0.00094	0.00095

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00113	-0.00113	-0.00113

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00113	0.00113	0.00113

Passive power(pJ) for S0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00077	-0.00116	-0.00132
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00075	-0.00115	-0.00131

Passive power(pJ) for S0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00721	0.00695	0.00685
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00690	0.00663	0.00654

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00378	0.00372	0.58584
sky130_osu_sc_15T_ms__nand2_l	0.00279	0.00276	0.35516

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.00007	0.00013
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00008	0.00016

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.07679	1.20733	13.01810
	B->Y (FR)	0.09040	1.20978	12.91150
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.10502	1.41121	13.38840
	B->Y (FR)	0.12200	1.42640	13.38240

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (RF)	0.05750	0.89028	9.71740
	B->Y (RF)	0.06427	0.88591	9.51910
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.07459	1.01300	9.91857
	B->Y (RF)	0.08127	1.01260	9.69823

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00378	0.00372	0.00371
	B	0.00000	0.00000	0.00000
	B	0.00462	0.00453	0.00452
sky130_osu_sc_15T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00276	0.00271	0.00270
	B	0.00000	0.00000	0.00000
	B	0.00332	0.00326	0.00327

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00039	-0.00045	-0.00047
	B	0.00000	0.00000	0.00000
	B	-0.00037	-0.00043	-0.00044
sky130_osu_sc_15T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00026	-0.00029	-0.00032
	B	0.00000	0.00000	0.00000
	B	-0.00024	-0.00027	-0.00030

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00239	-0.00242	-0.00242
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00163	-0.00165	-0.00165

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00241	0.00244	0.00243
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00165	0.00167	0.00166

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00222	-0.00224	-0.00223
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00152	-0.00153	-0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00223	0.00227	0.00223
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00153	0.00153	0.00153

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00372	0.00404	0.26054
sky130_osu_sc_15T_ms__nor2_l	0.00266	0.00301	0.17025

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.00007	0.00008
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00007	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.19688	1.62616	13.49470
	B->Y (FR)	0.16753	1.54903	13.08460
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.23927	1.84879	13.61560
	B->Y (FR)	0.21760	1.78432	13.33950

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (RF)	0.04321	0.60784	6.15095
	B->Y (RF)	0.03802	0.59950	6.13309
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.04944	0.65350	6.36677
	B->Y (RF)	0.04493	0.64660	6.35142

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00461	0.00451	0.00451
	B	0.00000	0.00000	0.00000
	B	0.00391	0.00377	0.00373
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00324	0.00318	0.00316
	B	0.00000	0.00000	0.00000
	B	0.00285	0.00275	0.00271

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00026	0.00011	0.00003
	B	0.00000	0.00000	0.00000
	B	-0.00054	-0.00056	-0.00064
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00016	0.00008	0.00002
	B	0.00000	0.00000	0.00000
	B	-0.00030	-0.00031	-0.00038

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00201	-0.00210	-0.00209
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00134	-0.00138	-0.00137

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00208	0.00210	0.00209
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00136	0.00138	0.00137

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00132	-0.00132	-0.00132
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00084	-0.00085	-0.00084

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00136	0.00136	0.00133
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00086	0.00087	0.00085

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00375	0.00379	0.00320	0.25924

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.00009	0.00014

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.23139	1.62995	13.23330
	A1->Y (FR)	0.26949	1.71652	13.65480
	B0->Y (FR)	0.12641	1.24522	11.23980

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (RF)	0.07601	0.73381	6.89035
	A1->Y (RF)	0.08367	0.72853	6.83759
	B0->Y (RF)	0.06255	0.74007	7.24181

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00508	0.00495	0.00489
	A1	0.00000	0.00000	0.00000
	A1	0.00583	0.00573	0.00570
	B0	0.00392	0.00378	0.00374

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00015	0.00014	0.00006
	A1	0.00000	0.00000	0.00000
	A1	0.00098	0.00084	0.00077
	B0	0.00151	0.00145	0.00137

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00132	-0.00133	-0.00132
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00205	-0.00211	-0.00210
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00216	-0.00217	-0.00216

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00136	0.00137	0.00133
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00210	0.00211	0.00210
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00216	0.00218	0.00217

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00196	-0.00205	-0.00204
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00203	-0.00210	-0.00209
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00213	-0.00214	-0.00213

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00203	0.00205	0.00204
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00208	0.00210	0.00209
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00213	0.00215	0.00214

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00168	-0.00169	-0.00173

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00173	0.00175	0.00173

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00358	0.00384	0.00399	0.00386	0.26030

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.00011	0.00013

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.29711	1.73512	13.60880
	A1->Y (FR)	0.26487	1.65238	13.19460
	B0->Y (FR)	0.18206	1.56461	13.10490
	B1->Y (FR)	0.21754	1.64801	13.52050

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (RF)	0.10901	0.77682	6.96548
	A1->Y (RF)	0.09305	0.75650	6.92658
	B0->Y (RF)	0.07900	0.76088	7.27930
	B1->Y (RF)	0.09606	0.78257	7.34201

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00732	0.00721	0.00718
	A1	0.00653	0.00639	0.00632
	B0	0.00489	0.00476	0.00469
	B1	0.00572	0.00560	0.00557

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00144	0.00130	0.00120
	A1	0.00067	0.00065	0.00054
	B0	0.00068	0.00065	0.00054
	B1	0.00146	0.00132	0.00121

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00201	-0.00210	-0.00209
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00201	-0.00210	-0.00209
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00203	-0.00210	-0.00209
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00214	-0.00214	-0.00214

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00208	0.00210	0.00209
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00208	0.00210	0.00209
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00209	0.00210	0.00209
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00214	0.00216	0.00215

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00131	-0.00131	-0.00131
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00131	-0.00131	-0.00131
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00201	-0.00207	-0.00206
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00212	-0.00213	-0.00212

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00135	0.00136	0.00132
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00135	0.00136	0.00132
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00206	0.00207	0.00206
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00212	0.00214	0.00213

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00129	-0.00131	-0.00130
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00129	-0.00131	-0.00130
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00226	-0.00233	-0.00232
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00230	-0.00232	-0.00237

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00134	0.00135	0.00131
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00134	0.00135	0.00131
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00232	0.00233	0.00232
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00237	0.00242	0.00238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00197	-0.00206	-0.00204
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00197	-0.00206	-0.00204
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00232	-0.00240	-0.00238
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00235	-0.00237	-0.00242

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00204	0.00206	0.00204
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00204	0.00206	0.00204
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00239	0.00240	0.00238
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00242	0.00244	0.00244

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00406	0.00386	0.58801
sky130_osu_sc_15T_ms__or2_2	0.00406	0.00386	1.18742
sky130_osu_sc_15T_ms__or2_4	0.00406	0.00386	2.27606
sky130_osu_sc_15T_ms__or2_8	0.00405	0.00387	4.43300
sky130_osu_sc_15T_ms__or2_l	0.00306	0.00284	0.35187

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.00011	0.00015
sky130_osu_sc_15T_ms__or2_2	0.00000	0.00016	0.00021
sky130_osu_sc_15T_ms__or2_4	0.00000	0.00026	0.00034
sky130_osu_sc_15T_ms__or2_8	0.00000	0.00044	0.00060
sky130_osu_sc_15T_ms__or2_l	0.00000	0.00013	0.00016

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.14062	1.15276	9.39427
	B->Y (RR)	0.13198	1.13146	9.24647
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.14852	1.03420	9.71507
	B->Y (RR)	0.13894	1.01674	9.61530
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.19579	0.99558	10.01970
	B->Y (RR)	0.18600	0.98174	9.93006
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.29015	1.03828	10.61360
	B->Y (RR)	0.28020	1.02830	10.54630
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.17860	1.38239	9.96223
	B->Y (RR)	0.16874	1.36154	9.82157

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (FF)	0.38325	1.15162	8.25404
	B->Y (FF)	0.33733	1.06402	7.68168
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.49072	1.23967	8.66838
	B->Y (FF)	0.44522	1.15354	8.15683
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.72911	1.48876	9.25898
	B->Y (FF)	0.68375	1.40019	8.84920
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	1.20045	2.01154	10.13910
	B->Y (FF)	1.15522	1.91975	9.82056
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.45422	1.24624	8.13320
	B->Y (FF)	0.40380	1.16101	7.67331

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00366	0.00333	0.00316
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00262	0.00249
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00635	0.00617	0.00596
	B	0.00000	0.00000	0.00000
	B	0.00551	0.00550	0.00537
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01227	0.01242	0.01223
	B	0.00000	0.00000	0.00000
	B	0.01144	0.01181	0.01173
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02398	0.02448	0.02516
	B	0.00000	0.00000	0.00000
	B	0.02315	0.02395	0.02486
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00264	0.00244	0.00226
	B	0.00000	0.00000	0.00000
	B	0.00214	0.00197	0.00182

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00792	0.00784	0.00780
	B	0.00000	0.00000	0.00000
	B	0.00695	0.00688	0.00683
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00968	0.00998	0.00994
	B	0.00000	0.00000	0.00000
	B	0.00870	0.00900	0.00896
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01407	0.01498	0.01512
	B	0.00000	0.00000	0.00000
	B	0.01309	0.01397	0.01412
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02281	0.02454	0.02558
	B	0.00000	0.00000	0.00000
	B	0.02180	0.02352	0.02450
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00587	0.00572	0.00568
	B	0.00000	0.00000	0.00000
	B	0.00517	0.00509	0.00504

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00203	-0.00211	-0.00210
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00203	-0.00211	-0.00210
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00203	-0.00211	-0.00210
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00203	-0.00211	-0.00210
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00135	-0.00139	-0.00138

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00209	0.00211	0.00210
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00209	0.00211	0.00210
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00209	0.00211	0.00210
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00209	0.00211	0.00210
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00138	0.00139	0.00138

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00132	-0.00133	-0.00132
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00132	-0.00133	-0.00132
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00132	-0.00133	-0.00132
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00132	-0.00133	-0.00132
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00086	-0.00086	-0.00086

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00137	0.00137	0.00133
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00137	0.00137	0.00133
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00137	0.00138	0.00133
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00137	0.00138	0.00134
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00089	0.00089	0.00087

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00402	0.00514	0.26184
sky130_osu_sc_15T_ms__tbufi_l	0.00301	0.00387	0.17048

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.00008	0.00013
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00009	0.00016

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.15751	1.53898	13.07930
	OE->Y (FR)	0.11496	0.56977	4.43496
	OE->Y (RR)	0.21940	1.49545	9.61904
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.20735	1.77813	13.34670
	OE->Y (FR)	0.13786	0.60366	4.62505
	OE->Y (RR)	0.26488	1.75262	10.13030

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.05519	0.71139	7.04845
	OE->Y (FF)	0.11613	0.56993	4.43373
	OE->Y (RF)	0.05515	0.69884	6.82727
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.07316	0.81142	7.42603
	OE->Y (FF)	0.13925	0.60569	4.62764
	OE->Y (RF)	0.06980	0.79611	7.16367

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00362	0.00349	0.00343
	OE	0.00000	0.00000	0.00000
	OE	0.00325	0.00287	0.00273
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00265	0.00256	0.00250
	OE	0.00000	0.00000	0.00000
	OE	0.00229	0.00201	0.00190

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00054	-0.00056	-0.00064
	OE	0.00000	0.00000	0.00000
	OE	0.00239	0.00201	0.00187
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00031	-0.00038
	OE	0.00000	0.00000	0.00000
	OE	0.00162	0.00133	0.00122

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00191	-0.00193	-0.00192
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00181	-0.00183	-0.00182
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00135	-0.00136	-0.00135
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00127	-0.00128	-0.00128

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00191	0.00193	0.00192
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00186	0.00187	0.00184
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00135	0.00136	0.00135
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00130	0.00131	0.00129

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00133	0.00095	0.00081
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00121	0.00082	0.00068
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00089	0.00060	0.00050
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00079	0.00051	0.00039

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00415	0.00381	0.00374
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00429	0.00396	0.00384
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00320	0.00292	0.00287
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00330	0.00305	0.00294

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tnbufi_1	0.00401	0.00609	0.26184
sky130_osu_sc_15T_ms__tnbufi_l	0.00300	0.00433	0.17019

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.00009	0.00011
sky130_osu_sc_15T_ms__tnbufi_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_15T_ms__tnbufi_1	A->Y (FR)	0.15892	1.53877	13.07900
	OE->Y (RR)	0.04297	0.33706	4.28394
	OE->Y (FR)	0.17676	1.60730	13.48810
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.20902	1.77647	13.33350
	OE->Y (RR)	0.04797	0.36130	4.28387
	OE->Y (FR)	0.21741	1.82989	13.60660

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (RF)	0.05403	0.71047	7.04804
	OE->Y (RF)	0.04255	0.33714	4.28398
	OE->Y (FF)	0.13656	0.85823	6.41470
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.07137	0.81038	7.42096
	OE->Y (RF)	0.04720	0.35889	4.28386
	OE->Y (FF)	0.17372	0.98236	6.79240

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00373	0.00360	0.00353
	OE	0.00000	0.00000	0.00000
	OE	0.00859	0.00838	0.00837
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00276	0.00267	0.00261
	OE	0.00000	0.00000	0.00000
	OE	0.00615	0.00596	0.00595

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00068	-0.00069	-0.00077
	OE	0.00000	0.00000	0.00000
	OE	0.00783	0.00763	0.00758
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00044	-0.00045	-0.00052
	OE	0.00000	0.00000	0.00000
	OE	0.00555	0.00537	0.00530

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00165	-0.00167	-0.00166
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00155	-0.00157	-0.00156
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00110	-0.00110	-0.00110
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00102	-0.00103	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00165	0.00167	0.00166
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00159	0.00160	0.00158
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00110	0.00110	0.00110
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00105	0.00105	0.00104

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00253	-0.00301	-0.00316
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00242	-0.00294	-0.00312
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00158	-0.00192	-0.00203
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00151	-0.00187	-0.00200

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00669	0.00646	0.00643
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00656	0.00633	0.00631
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00476	0.00456	0.00453
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00466	0.00446	0.00445

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00794	0.00698	0.26226

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.00022	0.00023

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.28385	1.57280	9.82144
	A->Y (FR)	!B	0.21344	1.59840	13.13160
	B->Y (RR)	A	0.23824	1.52397	9.69823
	B->Y (FR)	!A	0.24882	1.67734	13.53060

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.21702	0.95641	6.80728
	A->Y (RF)	!B	0.07746	0.71556	6.84302
	B->Y (FF)	A	0.20587	0.94547	6.78930
	B->Y (RF)	!A	0.08560	0.72739	6.85782

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00309	0.00267	0.00247
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00897	0.00853	0.00843
	B	A	0.00000	0.00000	0.00000
	B	A	0.00167	0.00131	0.00110
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00927	0.00894	0.00888

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01041	0.01003	0.00982
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00231	0.00193	0.00170
	B	A	0.00000	0.00000	0.00000
	B	A	0.00966	0.00947	0.00941
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00287	0.00239	0.00217

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00796	0.00703	0.25987

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.00022	0.00025

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.29788	1.57756	9.77493
	A->Y (FR)	B	0.22946	1.65268	13.50310
	B->Y (RR)	!A	0.24612	1.53513	9.71794
	B->Y (FR)	A	0.25308	1.68448	13.53790

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (FF)	!B	0.21604	0.95354	6.82181
	A->Y (RF)	B	0.07099	0.73124	7.05867
	B->Y (FF)	!A	0.20503	0.94297	6.78220
	B->Y (RF)	A	0.08157	0.72635	6.84108

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01009	0.00970	0.00962
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00209	0.00142	0.00115
	B	A	0.00000	0.00000	0.00000
	B	A	0.01021	0.00990	0.00981
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00149	0.00114	0.00094

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00188	0.00137	0.00108
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01094	0.01069	0.01062
	B	A	0.00000	0.00000	0.00000
	B	A	0.00189	0.00141	0.00116
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00987	0.00970	0.00964

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.09971
sky130_osu_sc_15T_ms__tiehi	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__ant	0.00000	52440.50000	104881.00000
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_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_15T_ms__ant	0.00000	0.00000	0.00000
	-0.00220	0.00655	0.10381

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	0.91401	0.85730	0.14749