sky130_osu_sc_15T_ms_tt_2P10_25C.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_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01599	0.01593	0.01227	2.49573	1.18376	2.39482
sky130_osu_sc_15T_ms__addf_l	0.01598	0.01592	0.01226	1.51648	1.18171	1.55099

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.88496	1.16706
sky130_osu_sc_15T_ms__addf_l	0.00000	0.56033	0.84243

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)	0.11162	1.42318	23.96470
	B->CO (RR)	0.10888	1.38639	23.19300
	CI->CO (RR)	0.10553	1.46162	24.64710
	CON->CO (FR)	0.01942	0.60877	10.23110
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.11570	1.31730	18.44840
	B->CO (RR)	0.11285	1.29536	18.20190
	CI->CO (RR)	0.10960	1.35724	19.17360
	CON->CO (FR)	0.02426	0.69399	10.32930

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)	0.14338	1.73205	29.05420
	B->CO (FF)	0.12748	1.67028	28.13170
	CI->CO (FF)	0.12540	1.75112	29.63200
	CON->CO (RF)	0.01909	0.55172	9.31485
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.13904	1.46689	20.36800
	B->CO (FF)	0.12359	1.42502	20.04080
	CI->CO (FF)	0.12107	1.48738	20.99760
	CON->CO (RF)	0.02055	0.54699	8.15180

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)	0.10995	0.75281	9.31514
	B->CON (FR)	0.09472	0.73591	9.40861
	CI->CON (FR)	0.09196	0.77194	9.96804
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.10380	0.74627	9.29784
	B->CON (FR)	0.08907	0.73001	9.39401
	CI->CON (FR)	0.08579	0.76539	9.95078

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)	0.07686	0.54990	6.83549
	B->CON (RF)	0.07498	0.56371	7.11921
	CI->CON (RF)	0.07075	0.59151	7.60371
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.07340	0.54639	6.82267
	B->CON (RF)	0.07174	0.56036	7.10804
	CI->CON (RF)	0.06727	0.58790	7.59129

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)	0.20969	1.54594	22.99250
	B->S (-R)	0.21913	1.52786	22.06570
	CI->S (-R)	0.19023	1.56272	23.58140
	CON->S (RR)	0.06135	0.51142	6.87243
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.20165	1.41349	18.16640
	B->S (-R)	0.19108	1.38487	17.79720
	CI->S (-R)	0.18213	1.43176	18.78760
	CON->S (RR)	0.06265	0.56494	6.75112

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)	0.18268	1.31332	18.85100
	B->S (-F)	0.18130	1.26965	18.25710
	CI->S (-F)	0.17610	1.34935	19.53830
	CON->S (FF)	0.07365	0.56328	7.12553
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.17134	1.16500	14.42670
	B->S (-F)	0.16751	1.13304	14.28290
	CI->S (-F)	0.16474	1.20224	15.15200
	CON->S (FF)	0.07014	0.56251	6.39999

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	0.00459	0.00775	0.07622
	B	0.00532	0.00813	0.07056
	CI	0.00715	0.01055	0.07910
sky130_osu_sc_15T_ms__addf_l	A	0.00327	0.00536	0.04595
	B	0.00402	0.00589	0.04336
	CI	0.00583	0.00821	0.04910

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01815	0.02257	0.12417
	B	0.01899	0.02253	0.11323
	CI	0.01530	0.02009	0.12365
sky130_osu_sc_15T_ms__addf_l	A	0.01686	0.01984	0.08095
	B	0.01770	0.02007	0.07498
	CI	0.01401	0.01743	0.08061

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01812	0.02078	0.07444
	B	0.01854	0.02090	0.06991
	CI	0.01528	0.01815	0.07469
sky130_osu_sc_15T_ms__addf_l	A	0.01683	0.01939	0.07034
	B	0.01730	0.01952	0.06617
	CI	0.01400	0.01674	0.07044

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00535	0.00668	0.04051
	B	0.00529	0.00706	0.04161
	CI	0.00712	0.00935	0.04861
sky130_osu_sc_15T_ms__addf_l	A	0.00407	0.00512	0.03551
	B	0.00401	0.00557	0.03697
	CI	0.00581	0.00780	0.04288

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01814	0.02243	0.11983
	B	0.00372	0.00273	0.09481
	CI	0.01529	0.01995	0.11932
sky130_osu_sc_15T_ms__addf_l	A	-0.00335	-0.00421	0.09257
	B	0.00160	0.00079	0.09967
	CI	0.00440	0.00627	0.09682

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.03994	0.04240	0.12877
	B	0.03558	0.03898	0.13698
	CI	0.03017	0.03284	0.11397
sky130_osu_sc_15T_ms__addf_l	A	0.03820	0.04050	0.13018
	B	0.03394	0.03761	0.13896
	CI	0.02845	0.03097	0.11557

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

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	0.00779	0.00866	2.43207	1.28789	2.50300
sky130_osu_sc_15T_ms__addh_l	0.00779	0.00866	1.59445	1.28338	1.62762

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	1.01281	1.16672
sky130_osu_sc_15T_ms__addh_l	0.00000	0.60693	0.84208

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)	0.07357	0.52398	6.78659
	B->CO (RR)	0.07648	0.51551	6.85059
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.07634	0.58473	6.85722
	B->CO (RR)	0.07926	0.57729	6.86789

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)	0.06308	0.52289	6.90340
	B->CO (FF)	0.06813	0.53754	6.99305
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.06005	0.48339	5.50708
	B->CO (FF)	0.06480	0.49777	5.59313

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	0.10268	0.42906	3.67716
	A->CON (FR)	!B	0.05832	0.71804	9.82056
	B->CON (RR)	A	0.10517	0.42014	3.74420
	B->CON (FR)	!A	0.07239	0.70298	9.34603
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.09453	0.41566	3.69268
	A->CON (FR)	!B	0.05290	0.71132	9.76776
	B->CON (RR)	A	0.09710	0.40711	3.70735
	B->CON (FR)	!A	0.06695	0.69621	9.31769

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	0.10096	0.55334	5.60962
	A->CON (RF)	!B	0.04474	0.56856	7.80968
	B->CON (FF)	A	0.09854	0.58203	6.00584
	B->CON (RF)	!A	0.05418	0.55850	7.48224
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.09361	0.53738	5.52980
	A->CON (RF)	!B	0.04159	0.56429	7.78824
	B->CON (FF)	A	0.09123	0.56610	5.92274
	B->CON (RF)	!A	0.05107	0.55200	7.46163

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	0.07622	1.40402	24.24960
	A->S (FR)	B	0.13342	1.37781	21.85470
	B->S (RR)	!A	0.08636	1.36518	23.29300
	B->S (FR)	A	0.13087	1.43627	22.88790
	CON->S (FR)	-	0.02143	0.62449	10.50220
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.07741	1.31616	19.57510
	A->S (FR)	B	0.13062	1.27961	17.14750
	B->S (RR)	!A	0.08779	1.28538	18.89680
	B->S (FR)	A	0.12797	1.32949	17.90600
	CON->S (FR)	-	0.02470	0.70320	10.64390

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	0.08757	1.59266	27.52960
	A->S (RF)	B	0.12918	1.09857	16.75390
	B->S (FF)	!A	0.10165	1.58248	27.12810
	B->S (RF)	A	0.13171	1.08936	16.81710
	CON->S (RF)	-	0.01803	0.53990	9.12201
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.08346	1.40082	20.82530
	A->S (RF)	B	0.12207	0.98086	12.52700
	B->S (FF)	!A	0.09754	1.38938	20.37670
	B->S (RF)	A	0.12464	0.97163	12.53280
	CON->S (RF)	-	0.01940	0.55158	8.39259

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	0.00837	0.00970	0.05100
	B	0.00000	0.00000	0.00000
	B	0.00749	0.00866	0.05577
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00720	0.00844	0.04815
	B	0.00000	0.00000	0.00000
	B	0.00631	0.00739	0.05406

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	0.01268	0.01496	0.07282
	B	0.00000	0.00000	0.00000
	B	0.01319	0.01648	0.07897
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01155	0.01349	0.06337
	B	0.00000	0.00000	0.00000
	B	0.01206	0.01482	0.06720

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	0.00836	0.00964	0.04551
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01136	0.01321	0.03886
	B	A	0.00000	0.00000	0.00000
	B	A	0.00748	0.00859	0.05550
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01280	0.01381	0.03625
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00718	0.00845	0.04776
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01052	0.01216	0.03185
	B	A	0.00000	0.00000	0.00000
	B	A	0.00630	0.00737	0.05421
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01195	0.01266	0.03085

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	0.01267	0.01471	0.06680
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00160	0.00309	0.02391
	B	A	0.00000	0.00000	0.00000
	B	A	0.01319	0.01621	0.07188
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00291	0.00403	0.02434
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01155	0.01348	0.06270
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00053	0.00151	0.01603
	B	A	0.00000	0.00000	0.00000
	B	A	0.01207	0.01477	0.06656
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00183	0.00221	0.01698

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	0.01269	0.01503	0.07432
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00164	0.00326	0.02985
	B	A	0.00000	0.00000	0.00000
	B	A	0.01321	0.01655	0.08017
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00294	0.00421	0.02833
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01156	0.01351	0.06355
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00055	0.00148	0.01581
	B	A	0.00000	0.00000	0.00000
	B	A	0.01208	0.01484	0.06722
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00187	0.00247	0.01649

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	0.00837	0.00992	0.04672
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01138	0.01330	0.04273
	B	A	0.00000	0.00000	0.00000
	B	A	0.00749	0.00866	0.05631
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01283	0.01416	0.04026
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00720	0.00844	0.04809
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01053	0.01202	0.03280
	B	A	0.00000	0.00000	0.00000
	B	A	0.00631	0.00741	0.05422
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01198	0.01277	0.02989

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00421	0.00432	2.44691
sky130_osu_sc_15T_ms__and2_2	0.00421	0.00432	4.72527
sky130_osu_sc_15T_ms__and2_4	0.00421	0.00432	9.00354
sky130_osu_sc_15T_ms__and2_6	0.00424	0.00432	13.34781
sky130_osu_sc_15T_ms__and2_8	0.00422	0.00434	17.15162
sky130_osu_sc_15T_ms__and2_l	0.00317	0.00328	1.52169

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.48609	0.77763
sky130_osu_sc_15T_ms__and2_2	0.00000	0.77765	0.77800
sky130_osu_sc_15T_ms__and2_4	0.00000	1.36078	1.55489
sky130_osu_sc_15T_ms__and2_6	0.00000	1.94391	2.33214
sky130_osu_sc_15T_ms__and2_8	0.00000	2.52703	3.10940
sky130_osu_sc_15T_ms__and2_l	0.00000	0.08021	0.12820

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)	0.05613	0.47623	6.80599
	B->Y (RR)	0.06003	0.46864	6.52322
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.06473	0.42889	6.78515
	B->Y (RR)	0.06864	0.41798	6.50139
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.08970	0.43709	6.91307
	B->Y (RR)	0.09365	0.42073	6.63772
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.11552	0.46819	7.09968
	B->Y (RR)	0.11937	0.44647	6.83412
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.14105	0.50175	7.17023
	B->Y (RR)	0.14499	0.47636	6.90084
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.06355	0.54877	6.63563
	B->Y (RR)	0.06764	0.54056	6.35231

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)	0.04958	0.47113	6.50694
	B->Y (FF)	0.05237	0.48207	6.57152
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.05579	0.42820	6.42515
	B->Y (FF)	0.05900	0.43859	6.51049
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.07702	0.43692	6.47662
	B->Y (FF)	0.07986	0.44424	6.56596
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.10060	0.46771	6.61595
	B->Y (FF)	0.10293	0.47341	6.70200
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.12283	0.49582	6.56292
	B->Y (FF)	0.12488	0.50066	6.64368
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.05583	0.51333	5.99384
	B->Y (FF)	0.05976	0.52668	6.09223

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	0.00578	0.01116	0.16045
	B	0.00000	0.00000	0.00000
	B	0.00585	0.00926	0.10861
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01203	0.01692	0.16406
	B	0.00000	0.00000	0.00000
	B	0.01212	0.01539	0.11369
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02672	0.03055	0.16863
	B	0.00000	0.00000	0.00000
	B	0.02679	0.02953	0.12381
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.04460	0.04664	0.17938
	B	0.00000	0.00000	0.00000
	B	0.04462	0.04562	0.13464
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.06469	0.06329	0.19281
	B	0.00000	0.00000	0.00000
	B	0.06458	0.06028	0.14689
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00414	0.00762	0.09999
	B	0.00000	0.00000	0.00000
	B	0.00425	0.00637	0.07037

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	0.01536	0.02296	0.14939
	B	0.00000	0.00000	0.00000
	B	0.01735	0.02443	0.14552
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01990	0.02759	0.15368
	B	0.00000	0.00000	0.00000
	B	0.02192	0.02898	0.15035
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.03308	0.03920	0.16407
	B	0.00000	0.00000	0.00000
	B	0.03490	0.04045	0.16081
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.04779	0.05214	0.17591
	B	0.00000	0.00000	0.00000
	B	0.04938	0.05231	0.17191
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.06632	0.06430	0.18742
	B	0.00000	0.00000	0.00000
	B	0.06768	0.06453	0.18234
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01164	0.01636	0.09534
	B	0.00000	0.00000	0.00000
	B	0.01304	0.01731	0.09262

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)	-0.00580	-0.00580	-0.00583
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00579	-0.00578	-0.00583
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00578	-0.00580	-0.00582
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00581	-0.00581	-0.00585
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00577	-0.00578	-0.00580
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00407	-0.00407	-0.00409

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)	0.00582	0.00596	0.00585
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00583	0.00596	0.00585
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00583	0.00596	0.00586
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00588	0.00601	0.00591
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00585	0.00597	0.00587
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00408	0.00418	0.00410

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)	-0.00549	-0.00553	-0.00551
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00549	-0.00553	-0.00550
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00548	-0.00553	-0.00550
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00547	-0.00552	-0.00549
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00547	-0.00551	-0.00548
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00387	-0.00390	-0.00388

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)	0.00557	0.00557	0.00553
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00558	0.00557	0.00553
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00559	0.00558	0.00554
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00559	0.00558	0.00555
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00560	0.00559	0.00555
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00394	0.00392	0.00389

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00399	0.00415	0.00400	1.12297

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.18517	0.38863

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)	0.05862	0.70301	9.16803
	A1->Y (FR)	0.04849	0.66403	8.78449
	B0->Y (FR)	0.04235	0.72746	9.81985

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)	0.04119	0.48645	6.29841
	A1->Y (RF)	0.03744	0.51780	6.85400
	B0->Y (RF)	0.02418	0.49578	6.77318

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	0.01392	0.01458	0.04124
	A1	0.00000	0.00000	0.00000
	A1	0.01162	0.01226	0.03829
	B0	0.00822	0.01077	0.04890

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	0.00276	0.00299	0.02084
	A1	0.00000	0.00000	0.00000
	A1	0.00284	0.00358	0.02357
	B0	-0.00154	-0.00012	0.02061

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)	-0.00413	-0.00508	-0.00507
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00511	-0.00513	-0.00512
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00512	-0.00514	-0.00512

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)	0.00505	0.00509	0.00507
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00511	0.00519	0.00514
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00518	0.00518	0.00514

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)	-0.00410	-0.00501	-0.00500
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00503	-0.00505	-0.00504
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00545	-0.00549	-0.00549

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)	0.00496	0.00501	0.00500
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00504	0.00507	0.00506
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00548	0.00551	0.00550

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)	-0.00228	-0.00232	-0.00228

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)	0.00243	0.00246	0.00232

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00399	0.00412	0.00426	0.00407	1.13963

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.20582	0.77725

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)	0.07155	0.70881	9.09615
	A1->Y (FR)	0.06347	0.69347	8.99220
	B0->Y (FR)	0.04284	0.71072	9.62615
	B1->Y (FR)	0.05107	0.73117	9.79957

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)	0.05470	0.50425	6.37998
	A1->Y (RF)	0.05087	0.53509	6.93790
	B0->Y (RF)	0.02643	0.50608	6.91298
	B1->Y (RF)	0.03033	0.47501	6.35654

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	0.01708	0.01762	0.04525
	A1	0.01479	0.01530	0.04200
	B0	0.00895	0.01156	0.05126
	B1	0.01121	0.01351	0.05296

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00590	0.00608	0.02493
	A1	0.00596	0.00667	0.02763
	B0	-0.00117	0.00019	0.02073
	B1	-0.00106	-0.00035	0.01799

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)	-0.00413	-0.00506	-0.00508
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00511	-0.00514	-0.00512
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00511	-0.00515	-0.00512
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00512	-0.00515	-0.00512

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)	0.00504	0.00511	0.00508
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00512	0.00519	0.00514
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00519	0.00518	0.00514
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00519	0.00518	0.00514

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)	-0.00410	-0.00499	-0.00499
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00503	-0.00506	-0.00503
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00544	-0.00547	-0.00548
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00544	-0.00547	-0.00548

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)	0.00496	0.00504	0.00500
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00503	0.00509	0.00506
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00546	0.00550	0.00549
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00546	0.00550	0.00549

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)	-0.00228	-0.00234	-0.00229
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00227	-0.00229	-0.00228
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00563	-0.00566	-0.00567
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00563	-0.00567	-0.00567

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)	0.00252	0.00254	0.00234
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00228	0.00229	0.00228
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00565	0.00569	0.00568
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00565	0.00569	0.00568

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)	-0.00230	-0.00235	-0.00231
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00228	-0.00232	-0.00230
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00520	-0.00523	-0.00522
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00520	-0.00523	-0.00522

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)	0.00255	0.00256	0.00236
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00229	0.00232	0.00230
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00528	0.00525	0.00523
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00528	0.00524	0.00523

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

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	0.00431	2.43456
sky130_osu_sc_15T_ms__buf_2	0.00435	4.75428
sky130_osu_sc_15T_ms__buf_4	0.00434	9.08275
sky130_osu_sc_15T_ms__buf_6	0.00092	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00436	17.49685
sky130_osu_sc_15T_ms__buf_l	0.00330	1.50415

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.38900	0.38900
sky130_osu_sc_15T_ms__buf_2	0.00000	0.58350	0.77763
sky130_osu_sc_15T_ms__buf_4	0.00000	0.97250	1.55489
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	1.75050	3.10940
sky130_osu_sc_15T_ms__buf_l	0.00000	0.06437	0.06437

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)	0.04424	0.44781	6.47107
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.05069	0.39514	6.45479
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.06877	0.39248	6.55628
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.10529	0.44143	6.80229
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.05042	0.50921	6.13548

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)	0.04674	0.46640	6.57251
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.05442	0.43960	6.80377
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.07577	0.44854	6.95919
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.12161	0.50670	7.15320
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.05336	0.50737	6.03244

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	0.00539	0.01039	0.11643
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01138	0.01606	0.11847
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02517	0.03012	0.13118
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.05783	0.06109	0.21558
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00403	0.00732	0.08104

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	0.01462	0.02226	0.15148
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01923	0.02658	0.14220
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.03197	0.03807	0.15398
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.06469	0.06270	0.17730
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01117	0.01640	0.09719

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
	-0.00100	-0.00101	-0.00098

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
	0.00100	0.00101	0.00098

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00410	0.00406	0.01188	2.21255	2.20436
sky130_osu_sc_15T_ms__dffr_l	0.00410	0.00406	0.01186	1.51093	1.51565

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	1.10740	1.88822
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.78277	1.56359

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)	0.22419	1.12672	14.60180
	QN->Q (FR)	0.02488	0.72815	11.91770
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.21916	1.22226	14.19760
	QN->Q (FR)	0.02727	0.77550	11.54120

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)	0.22181	1.14484	15.28280
	QN->Q (RF)	0.02154	0.60509	9.86591
	RN->Q (FF)	0.16471	1.15350	16.16720
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.22537	1.25648	14.83750
	QN->Q (RF)	0.02201	0.60381	8.99863
	RN->Q (FF)	0.16860	1.26431	15.72280

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)	0.19634	0.62561	6.43374
	RN->QN (FR)	0.13920	0.63375	7.31699
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.19759	0.68896	6.53860
	RN->QN (FR)	0.14071	0.69708	7.41701

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)**	0.19368	0.58229	5.36473
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.18374	0.59004	4.95818

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)	-0.05761	-0.06116	0.14764
	setup	CK (R)	0.17904	0.20387	2.34735
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05954	-0.06116	0.14699
	setup	CK (R)	0.17952	0.20471	2.83984

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)	-0.08496	-0.23440	0.99563
	setup	CK (R)	0.10582	0.24246	3.12514
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08349	-0.23367	0.44800
	setup	CK (R)	0.10548	0.24246	3.12752

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)	-0.05761	-0.06116	0.14764
	setup	CK (R)	0.17904	0.20387	2.34735
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05954	-0.06116	0.14699
	setup	CK (R)	0.17952	0.20471	2.83984

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)	-0.08496	-0.23440	0.99563
	setup	CK (R)	0.10582	0.24246	3.12514
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.08349	-0.23367	0.44800
	setup	CK (R)	0.10548	0.24246	3.12752

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)	0.15292	0.18172	1.54585
	removal	CK (R)	-0.03890	-0.04643	-0.11603
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.14935	0.18260	1.99128
	removal	CK (R)	-0.03890	-0.04643	-0.11711

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)	0.15292	0.18172	1.54585
	removal	CK (R)	-0.03890	-0.04643	-0.11603
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.14935	0.18260	1.99128
	removal	CK (R)	-0.03890	-0.04643	-0.11711

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 ()	0.09352	0.44800	13.33370
	min_pulse_width	RN ()	0.09352	0.44800	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.09352	0.44800	13.33370
	min_pulse_width	RN ()	0.09352	0.44800	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 ()	0.10702	0.44800	13.33370
	min_pulse_width	CK ()	0.11377	0.44800	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.10027	0.44800	13.33370
	min_pulse_width	CK ()	0.11040	0.44800	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 ()	0.22518	0.44800	13.33370
	min_pulse_width	CK ()	0.08677	0.44800	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.22518	0.44800	13.33370
	min_pulse_width	CK ()	0.08677	0.44800	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	0.01503	0.01619	0.05607
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01309	0.01580	0.08976

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	0.01707	0.01464	0.01320
	RN	-0.00187	-0.13837	-2.43933
	RN	0.03965	0.03826	0.03916
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01523	0.01509	0.05988
	RN	-0.00187	-0.11006	-1.66579
	RN	0.03778	0.03870	0.08573

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	0.01706	0.01465	0.01325
	RN	-0.00187	-0.13806	-2.43016
	RN	0.03964	0.03825	0.03957
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01522	0.01508	0.05931
	RN	-0.00187	-0.11027	-1.67098
	RN	0.03777	0.03867	0.08554

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	0.01497	0.01612	0.05516
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01303	0.01573	0.08941

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	-0.00409	-0.00495	-0.00502
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01869	0.02096	0.12421
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00779	0.01024	0.11213
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00410	-0.00495	-0.00502
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01868	0.02096	0.12421
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00779	0.01025	0.11213

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	0.00503	0.00506	0.00506
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03051	0.03381	0.13937
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01476	0.01801	0.12091
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00502	0.00506	0.00506
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03051	0.03381	0.13937
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01476	0.01801	0.12091

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)	0.00524	0.01074	0.16826
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01639	0.02158	0.18354
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)	0.00523	0.01074	0.16825
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01638	0.02158	0.18353

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)	0.01438	0.02198	0.18029
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03004	0.03707	0.19984
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)	0.01437	0.02197	0.18028
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03003	0.03706	0.19984

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)	-0.00150	0.00357	0.16137
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00908	0.01337	0.17909
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00198	0.00328	0.16023
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00150	0.00357	0.16137
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00908	0.01336	0.17909
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00198	0.00328	0.16023

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)	0.02163	0.02963	0.18824
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04713	0.05357	0.25403
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03572	0.04240	0.20730
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04571	0.05981	0.30921
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02466	0.03239	0.18974
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02162	0.02963	0.18824
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04713	0.05356	0.25403
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03572	0.04229	0.20730
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.04571	0.05983	0.30921
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02466	0.03239	0.18974

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00406	0.00407	0.00898	0.01214	2.50534	2.50666
sky130_osu_sc_15T_ms__dffsr_l	0.00406	0.00407	0.00896	0.01214	1.53442	1.51843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	1.35689	1.88789
sky130_osu_sc_15T_ms__dffsr_l	0.00000	1.03226	1.56326

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)	0.22082	1.14657	15.79940
	QN->Q (FR)	0.02160	0.66935	11.30390
	RN->Q (RR)	0.18041	1.12081	15.93360
	SN->Q (FR)	0.16022	1.16020	16.89260
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.22257	1.23253	14.38800
	QN->Q (FR)	0.02726	0.77813	11.63100
	RN->Q (RR)	0.18261	1.20754	14.51460
	SN->Q (FR)	0.16230	1.24321	15.47240

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)	0.25433	1.20355	16.46570
	QN->Q (RF)	0.02125	0.63416	10.73010
	RN->Q (FF)	0.17053	1.18792	17.35620
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.26244	1.30651	15.10990
	QN->Q (RF)	0.02197	0.60666	9.07236
	RN->Q (FF)	0.17828	1.29099	15.99070

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)	0.22871	0.65554	6.66007
	RN->QN (FR)	0.14520	0.64042	7.54683
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.23428	0.73045	6.59068
	RN->QN (FR)	0.15037	0.71460	7.47429

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)	0.19322	0.60421	6.09220
	RN->QN (RF)	0.15311	0.57834	6.22334
	SN->QN (FF)	0.13295	0.61706	7.18234
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.18822	0.59322	4.94974
	RN->QN (RF)	0.14860	0.56814	5.07702
	SN->QN (FF)	0.12836	0.60346	6.03005

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)	-0.05657	-0.06564	0.12009
	setup	CK (R)	0.17059	0.20217	2.44574
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05831	-0.06568	0.12002
	setup	CK (R)	0.17281	0.19854	2.29422

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)	-0.09698	-0.24876	0.44954
	setup	CK (R)	0.12258	0.26140	3.18265
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09894	-0.25154	0.40078
	setup	CK (R)	0.12372	0.26140	3.18242

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)	-0.05657	-0.06564	0.12009
	setup	CK (R)	0.17059	0.20217	2.44574
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05831	-0.06568	0.12002
	setup	CK (R)	0.17281	0.19854	2.29422

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)	-0.09698	-0.24876	0.44954
	setup	CK (R)	0.12258	0.26140	3.18265
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.09894	-0.25154	0.40078
	setup	CK (R)	0.12372	0.26140	3.18242

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)	0.12839	0.16302	1.35482
	removal	CK (R)	-0.02096	-0.02422	-0.05438
	hold	SN (R)	-0.12727	-0.24039	-1.00732
	setup	SN (R)	0.14913	0.28248	6.09812
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.13151	0.16324	1.33900
	removal	CK (R)	-0.01948	-0.02322	-0.05492
	hold	SN (R)	-0.12246	-0.23266	-0.97388
	setup	SN (R)	0.14949	0.27255	6.00486

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)	0.12839	0.16302	1.35482
	removal	CK (R)	-0.02096	-0.02422	-0.05438
	hold	SN (R)	-0.12727	-0.24039	-1.00864
	hold	SN (R)	-0.12819	-0.24197	-1.00732
	setup	SN (R)	0.14913	0.27915	5.96142
	setup	SN (R)	0.14837	0.28248	6.09812
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.13151	0.16324	1.33900
	removal	CK (R)	-0.01948	-0.02322	-0.05492
	hold	SN (R)	-0.12372	-0.23266	-0.97388
	hold	SN (R)	-0.12246	-0.23428	-0.97439
	setup	SN (R)	0.14949	0.27146	5.96008
	setup	SN (R)	0.14341	0.27255	6.00486

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 ()	0.11040	0.44800	13.33370
	min_pulse_width	RN ()	0.11377	0.44800	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.11040	0.44800	13.33370
	min_pulse_width	RN ()	0.10702	0.44800	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)	0.03298	0.06730	5.81131
	removal	CK (R)	-0.01947	-0.05304	-0.33715
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03221	0.06693	5.52697
	removal	CK (R)	-0.01947	-0.05304	-0.33715

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)	0.03298	0.06730	5.81131
	removal	CK (R)	-0.01947	-0.05304	-0.33715
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03221	0.06693	5.52697
	removal	CK (R)	-0.01947	-0.05304	-0.33715

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 ()	0.12728	0.44800	13.33370
	min_pulse_width	SN ()	0.12728	0.44800	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.12728	0.44800	13.33370
	min_pulse_width	SN ()	0.12390	0.44800	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 ()	0.10027	0.44800	13.33370
	min_pulse_width	CK ()	0.13065	0.44800	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.09689	0.44800	13.33370
	min_pulse_width	CK ()	0.12728	0.44800	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 ()	0.21843	0.44800	13.33370
	min_pulse_width	CK ()	0.10702	0.44800	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.21843	0.44800	13.33370
	min_pulse_width	CK ()	0.10702	0.44800	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	0.01896	0.01934	0.04840
	RN	0.03457	0.03278	0.03818
	SN	-0.00187	-0.14908	-2.76213
	SN	0.03303	0.03052	0.03414
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01724	0.01962	0.09327
	RN	0.03286	0.03304	0.08396
	SN	-0.00187	-0.11109	-1.69170
	SN	0.03133	0.03084	0.08043

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	0.01995	0.01955	0.04611
	RN	-0.00187	-0.14908	-2.76211
	RN	0.04158	0.04199	0.07333
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01817	0.01814	0.06224
	RN	-0.00187	-0.11109	-1.69169
	RN	0.03889	0.03986	0.09004

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	0.01993	0.01951	0.04551
	RN	-0.00187	-0.14913	-2.76295
	RN	0.04068	0.04118	0.07363
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01815	0.01814	0.06272
	RN	-0.00187	-0.11039	-1.67405
	RN	0.03888	0.03984	0.09039

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	0.01890	0.01934	0.04665
	RN	0.03452	0.03286	0.03753
	SN	-0.00187	-0.14913	-2.76334
	SN	0.03299	0.03047	0.03454
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01718	0.01967	0.09326
	RN	0.03278	0.03315	0.08403
	SN	-0.00187	-0.11039	-1.67396
	SN	0.03128	0.03082	0.08113

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	-0.00495	-0.00502	-0.00503
	(!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)	0.02428	0.02644	0.12994
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00896	0.01133	0.11266
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00897	0.01133	0.11276
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00903	0.01141	0.11274
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00495	-0.00502	-0.00503
	(!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)	0.02427	0.02644	0.12994
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00896	0.01133	0.11266
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00897	0.01133	0.11277
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00903	0.01141	0.11274

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	0.00508	0.00505	0.00503
	(!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)	0.03518	0.03810	0.14303
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01567	0.01887	0.12141
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01592	0.01897	0.12138
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01560	0.01880	0.12134
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00508	0.00504	0.00503
	(!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)	0.03516	0.03808	0.14302
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01566	0.01886	0.12140
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01590	0.01895	0.12136
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01558	0.01878	0.12132

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)	0.00435	0.00962	0.16682
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02000	0.02505	0.18910
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)	0.00435	0.00963	0.16683
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02000	0.02505	0.18911

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)	0.01541	0.02326	0.18170
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03178	0.03880	0.20354
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)	0.01539	0.02324	0.18168
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03175	0.03878	0.20352

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)	-0.01149	-0.01155	-0.01155
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01051	-0.01222	-0.01217
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01073	-0.01156	-0.01158
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00740	0.00993	0.11290
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)	-0.01149	-0.01155	-0.01155
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.01048	-0.01220	-0.01215
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.01073	-0.01156	-0.01158
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00741	0.00993	0.11291

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)	0.01156	0.01158	0.01161
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01215	0.01227	0.01223
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01158	0.01175	0.01164
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02519	0.02722	0.12912
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)	0.01156	0.01158	0.01161
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01212	0.01224	0.01220
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01157	0.01174	0.01163
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02517	0.02721	0.12910

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)	-0.00149	0.00357	0.16145
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01049	0.01480	0.18022
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01018	0.01454	0.18008
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00169	0.00357	0.16060
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00576	0.01509	0.29551
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00150	0.00357	0.16145
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01047	0.01478	0.18021
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01017	0.01453	0.18007
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00170	0.00357	0.16060
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00576	0.01510	0.29552

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)	0.05306	0.05958	0.25964
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02171	0.02963	0.18840
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03656	0.04332	0.20796
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03664	0.04340	0.20793
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.05028	0.06354	0.31514
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02447	0.03217	0.18963
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02918	0.04291	0.32442
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.05306	0.05957	0.25964
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02171	0.02963	0.18840
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03655	0.04332	0.20796
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03664	0.04340	0.20793
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.05026	0.06355	0.31512
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02446	0.03216	0.18962
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02916	0.04289	0.32441

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00409	0.00706	0.01192	2.23556	2.22175
sky130_osu_sc_15T_ms__dffs_l	0.00409	0.00706	0.01192	1.53288	1.52736

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.97647	1.49848
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.65184	1.17385

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)	0.17979	1.07356	14.63130
	QN->Q (FR)	0.02482	0.72676	11.92510
	SN->Q (FR)	0.14021	1.15387	15.99950
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.17880	1.17944	14.29930
	QN->Q (FR)	0.02721	0.77596	11.59760
	SN->Q (FR)	0.13947	1.25437	15.64010

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)	0.24387	1.17573	15.42990
	QN->Q (RF)	0.02143	0.60408	9.88868
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.24665	1.28832	15.04540
	QN->Q (RF)	0.02192	0.60420	9.04858

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)	0.21782	0.65307	6.48572
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.21836	0.71503	6.59464

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)	0.15147	0.52886	5.31410
	SN->QN (FF)	0.11157	0.60907	6.68225
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.14576	0.54255	4.91212
	SN->QN (FF)	0.10632	0.61745	6.25776

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)	-0.04526	-0.05124	0.15090
	setup	CK (R)	0.13533	0.16814	1.60814
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.04655	-0.05304	0.15071
	setup	CK (R)	0.13533	0.16856	1.56428

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)	-0.08858	-0.23488	-0.15778
	setup	CK (R)	0.11340	0.24625	3.14284
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.08874	-0.23488	-0.18144
	setup	CK (R)	0.11340	0.24625	3.14284

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)	-0.04526	-0.05124	0.15090
	setup	CK (R)	0.13533	0.16814	1.60814
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.04655	-0.05304	0.15071
	setup	CK (R)	0.13533	0.16856	1.56428

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)	-0.08858	-0.23488	-0.15778
	setup	CK (R)	0.11340	0.24625	3.14284
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.08874	-0.23488	-0.18144
	setup	CK (R)	0.11340	0.24625	3.14284

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)	0.03075	0.05683	4.53082
	removal	CK (R)	-0.01618	-0.04546	-0.15829
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03433	0.05683	4.26381
	removal	CK (R)	-0.01618	-0.04546	-0.15829

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)	0.03075	0.05683	4.53082
	removal	CK (R)	-0.01618	-0.04546	-0.15829
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03433	0.05683	4.26381
	removal	CK (R)	-0.01618	-0.04546	-0.15829

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 ()	0.10027	0.44800	13.33370
	min_pulse_width	SN ()	0.10365	0.44800	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.10027	0.44800	13.33370
	min_pulse_width	SN ()	0.09689	0.44800	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 ()	0.08001	0.44800	13.33370
	min_pulse_width	CK ()	0.12390	0.44800	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.07664	0.44800	13.33370
	min_pulse_width	CK ()	0.11715	0.44800	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 ()	0.18129	0.44800	13.33370
	min_pulse_width	CK ()	0.09689	0.44800	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.18129	0.44800	13.33370
	min_pulse_width	CK ()	0.09689	0.44800	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	0.01489	0.01615	0.05764
	SN	-0.00187	-0.13923	-2.46471
	SN	0.02710	0.02628	0.03944
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01300	0.01569	0.09052
	SN	-0.00187	-0.11102	-1.69000
	SN	0.02522	0.02596	0.07274

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	0.01699	0.01466	0.01463
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01511	0.01507	0.06128

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	0.01697	0.01468	0.01519
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01511	0.01505	0.06051

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	0.01483	0.01603	0.05605
	SN	-0.00187	-0.13871	-2.44926
	SN	0.02705	0.02626	0.03902
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01294	0.01568	0.08969
	SN	-0.00187	-0.11078	-1.68381
	SN	0.02518	0.02593	0.07275

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	-0.00503	-0.00510	-0.00510
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01789	0.02031	0.12573
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00761	0.01008	0.11200
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00503	-0.00510	-0.00510
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01788	0.02031	0.12573
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00761	0.01008	0.11200

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	0.00515	0.00512	0.00510
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02985	0.03296	0.13837
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01493	0.01829	0.12141
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00515	0.00511	0.00510
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02985	0.03296	0.13837
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01493	0.01829	0.12141

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)	-0.00821	-0.00828	-0.00826
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00618	0.00829	0.09748
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)	-0.00820	-0.00829	-0.00826
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00618	0.00829	0.09748

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)	0.00830	0.00832	0.00830
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01725	0.02035	0.11043
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)	0.00829	0.00831	0.00830
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01725	0.02034	0.11043

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)	-0.00154	0.00354	0.16155
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00191	0.00338	0.16054
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00432	0.01406	0.29563
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00155	0.00354	0.16155
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00192	0.00338	0.16053
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00432	0.01406	0.29563

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)	0.04667	0.05317	0.25509
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02165	0.02967	0.18849
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04484	0.05855	0.30844
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02456	0.03213	0.18987
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02829	0.04247	0.32495
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.04666	0.05317	0.25509
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02164	0.02967	0.18849
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.04484	0.05855	0.30844
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02456	0.03213	0.18987
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02828	0.04248	0.32495

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

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	0.00424	0.01171	2.50927	2.51359
sky130_osu_sc_15T_ms__dff_l	0.00424	0.01171	1.36001	1.35199

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	1.23769	1.55609
sky130_osu_sc_15T_ms__dff_l	0.00000	0.91306	1.23146

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)	0.14873	1.06208	15.68030
	QN->Q (FR)	0.02146	0.66770	11.27010
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.15533	1.12669	13.19390
	QN->Q (FR)	0.03092	0.83449	12.06240

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)	0.20992	1.15226	16.41440
	QN->Q (RF)	0.02116	0.63292	10.71180
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.22118	1.23694	14.02040
	QN->Q (RF)	0.02205	0.58006	8.43095

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)	0.18493	0.60556	6.61085
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.19339	0.69291	6.37382

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)	0.12364	0.52127	5.98946
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.12195	0.49264	4.28812

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)	-0.03898	-0.04546	0.14974
	setup	CK (R)	0.10140	0.14389	1.08399
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.03898	-0.04546	0.14452
	setup	CK (R)	0.10391	0.14239	1.03563

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)	-0.07994	-0.23535	-0.73871
	setup	CK (R)	0.09879	0.24625	3.14138
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.08213	-0.23594	-0.65150
	setup	CK (R)	0.09879	0.24625	3.14364

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 ()	0.06651	0.44800	13.33370
	min_pulse_width	CK ()	0.11040	0.44800	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.06313	0.44800	13.33370
	min_pulse_width	CK ()	0.10702	0.44800	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 ()**	0.14753	0.44800	13.33370
	min_pulse_width	**CK ()**	0.07664	0.44800	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.14753	0.44800	13.33370
	min_pulse_width	**CK ()**	0.07664	0.44800	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	0.01568	0.01648	0.04728
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01406	0.01700	0.09855

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	0.01729	0.01703	0.04570
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01550	0.01437	0.04622

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	0.01728	0.01702	0.04556
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01550	0.01437	0.04618

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	0.01563	0.01640	0.04680
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01400	0.01699	0.09651

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	-0.00410	-0.00494	-0.00501
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01667	0.01940	0.12657
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00410	-0.00494	-0.00501
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01668	0.01940	0.12658

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	0.00501	0.00504	0.00504
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03084	0.03416	0.14066
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00501	0.00504	0.00504
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03085	0.03417	0.14067

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)	-0.00154	0.00357	0.16158
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00189	0.00343	0.16058
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00154	0.00357	0.16158
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00189	0.00341	0.16058

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)	0.02153	0.02955	0.18837
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04550	0.05210	0.25546
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04557	0.05964	0.31437
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02443	0.03219	0.18974
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02152	0.02955	0.18837
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.04551	0.05210	0.25546
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.04558	0.05965	0.31438
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02443	0.03218	0.18974

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

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	0.00412	2.28510
sky130_osu_sc_15T_ms__inv_10	0.03810	20.57548
sky130_osu_sc_15T_ms__inv_2	0.00781	4.49989
sky130_osu_sc_15T_ms__inv_3	0.01162	6.42972
sky130_osu_sc_15T_ms__inv_4	0.01535	8.63782
sky130_osu_sc_15T_ms__inv_6	0.02301	12.74621
sky130_osu_sc_15T_ms__inv_8	0.03055	16.44293
sky130_osu_sc_15T_ms__inv_l	0.00306	1.27565

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.19450	0.38863
sky130_osu_sc_15T_ms__inv_10	0.00000	1.94500	3.88628
sky130_osu_sc_15T_ms__inv_2	0.00000	0.38900	0.77726
sky130_osu_sc_15T_ms__inv_3	0.00000	0.58350	1.16589
sky130_osu_sc_15T_ms__inv_4	0.00000	0.77800	1.55451
sky130_osu_sc_15T_ms__inv_6	0.00000	1.16700	2.33177
sky130_osu_sc_15T_ms__inv_8	0.00000	1.55600	3.10902
sky130_osu_sc_15T_ms__inv_l	0.00000	0.03219	0.06383

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)**	0.02046	0.60223	9.88725
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03085	0.39117	9.81974
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01681	0.51456	9.80958
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.01878	0.47889	9.79920
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.01932	0.44980	9.76880
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02220	0.41803	9.78205
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02620	0.39770	9.66630
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.02655	0.68991	9.82924

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)**	0.01884	0.53624	8.82389
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.02965	0.32703	8.72624
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01569	0.45374	8.78790
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01748	0.42113	8.84841
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01756	0.39109	8.81988
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02169	0.35996	8.82809
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02548	0.33846	8.70017
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02015	0.51166	7.30244

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	0.00770	0.01102	0.04332
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.06752	0.10928	0.41462
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01359	0.02079	0.08371
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.02092	0.03229	0.12543
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02688	0.04160	0.16583
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.04004	0.06833	0.24819
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.05342	0.08788	0.33636
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00571	0.00775	0.03168

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	-0.00188	-0.00037	0.01611
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.02390	-0.00318	0.15626
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00552	-0.00203	0.03032
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00735	-0.00222	0.04656
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.01094	-0.00303	0.06064
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01665	-0.00358	0.09056
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.02139	-0.00481	0.12579
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00115	0.00012	0.01378

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.02466	0.02450	0.00840	0.01851

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.39171	0.39909

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)	-	0.01039	0.03932	0.08891
	A1->Y (RR)	-	0.01137	0.03974	0.08879
	S0->Y (RR)	(!A0 * A1)	0.03734	0.10882	-0.13413
	S0->Y (FR)	(A0 * !A1)	0.02722	0.14663	0.88558

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)	-	0.01048	0.04428	0.09156
	A1->Y (FF)	-	0.01001	0.04371	0.09126
	S0->Y (FF)	(!A0 * A1)	0.04434	0.17143	0.82020
	S0->Y (RF)	(A0 * !A1)	0.02201	0.08741	-0.03602

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	-	-0.00771	-0.00773	-0.00774
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00512	-0.00513	-0.00514
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00941	0.01799	0.17670
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00549	0.00078	0.15801

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	-	0.00771	0.00773	0.00774
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00513	0.00514	0.00514
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00115	0.00863	0.16672
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.02090	0.02871	0.18630

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)	-0.00180	-0.00180	-0.00179

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)	0.00180	0.00180	0.00180

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)	-0.00215	-0.00215	-0.00215

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)	0.00215	0.00215	0.00215

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)	-0.00220	0.00457	0.16224
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00215	0.00450	0.16254

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)	0.01593	0.02389	0.18182
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01439	0.02288	0.18133

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00412	0.00409	1.94395
sky130_osu_sc_15T_ms__nand2_l	0.00306	0.00306	1.26322

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.19452	0.77726
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.03220	0.12766

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)	0.02103	0.57303	9.02063
	B->Y (FR)	0.02508	0.56830	8.86525
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.02719	0.68906	9.79729
	B->Y (FR)	0.03302	0.69345	9.77199

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)	0.02603	0.62717	9.97260
	B->Y (RF)	0.02977	0.60250	9.47746
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.02817	0.64359	9.11444
	B->Y (RF)	0.03147	0.61545	8.55045

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	0.00820	0.01134	0.04251
	B	0.00000	0.00000	0.00000
	B	0.01054	0.01333	0.04547
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00602	0.00790	0.02801
	B	0.00000	0.00000	0.00000
	B	0.00769	0.00922	0.03018

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	-0.00141	-0.00024	0.01556
	B	0.00000	0.00000	0.00000
	B	-0.00136	-0.00070	0.01340
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00089	0.00015	0.01188
	B	0.00000	0.00000	0.00000
	B	-0.00086	-0.00043	0.01049

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)	-0.00568	-0.00569	-0.00571
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00391	-0.00390	-0.00393

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)	0.00570	0.00584	0.00573
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00392	0.00401	0.00394

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)	-0.00528	-0.00530	-0.00529
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00363	-0.00366	-0.00365

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)	0.00535	0.00533	0.00530
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00370	0.00368	0.00366

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00409	0.00438	1.27786
sky130_osu_sc_15T_ms__nor2_l	0.00296	0.00328	0.80354

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.13969	0.38863
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.02528	0.06383

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)	0.04198	0.67676	9.36113
	B->Y (FR)	0.03162	0.69580	9.83487
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.04995	0.77855	9.45336
	B->Y (FR)	0.04064	0.80182	10.00190

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)	0.02637	0.44636	6.16359
	B->Y (RF)	0.02031	0.43601	6.14413
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02602	0.44163	5.42022
	B->Y (RF)	0.02143	0.43398	5.40310

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	0.01128	0.01229	0.03961
	B	0.00000	0.00000	0.00000
	B	0.00840	0.01106	0.04943
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00793	0.00855	0.02918
	B	0.00000	0.00000	0.00000
	B	0.00614	0.00785	0.03394

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	0.00104	0.00204	0.02371
	B	0.00000	0.00000	0.00000
	B	-0.00142	0.00009	0.02074
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00063	0.00138	0.01899
	B	0.00000	0.00000	0.00000
	B	-0.00082	0.00020	0.01682

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)	-0.00414	-0.00504	-0.00505
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00279	-0.00334	-0.00334

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)	0.00503	0.00509	0.00506
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00332	0.00338	0.00334

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)	-0.00228	-0.00234	-0.00229
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00150	-0.00152	-0.00149

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)	0.00237	0.00240	0.00232
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00155	0.00156	0.00151

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00412	0.00422	0.00348	1.22055

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.09392	0.45246

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)	0.04488	0.71072	9.75441
	A1->Y (FR)	0.05827	0.69707	9.31273
	B0->Y (FR)	0.03113	0.64929	9.10438

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)	0.03683	0.52122	7.02612
	A1->Y (RF)	0.04436	0.51490	6.82853
	B0->Y (RF)	0.02818	0.56640	7.90597

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	0.01176	0.01367	0.04615
	A1	0.00000	0.00000	0.00000
	A1	0.01464	0.01535	0.04037
	B0	0.00672	0.00868	0.03642

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	0.00001	0.00053	0.01665
	A1	0.00000	0.00000	0.00000
	A1	0.00254	0.00274	0.01945
	B0	0.00084	0.00178	0.01743

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)	-0.00229	-0.00233	-0.00230
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00502	-0.00510	-0.00509
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00515	-0.00518	-0.00515

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)	0.00239	0.00241	0.00233
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00506	0.00510	0.00509
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00515	0.00518	0.00516

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)	-0.00401	-0.00495	-0.00495
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00498	-0.00507	-0.00503
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00508	-0.00508	-0.00509

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)	0.00492	0.00499	0.00496
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00501	0.00507	0.00503
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00509	0.00512	0.00510

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)	-0.00403	-0.00404	-0.00409

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)	0.00408	0.00411	0.00410

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00400	0.00422	0.00433	0.00424	1.27027

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.20955	0.77725

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)	0.06293	0.69741	9.35534
	A1->Y (FR)	0.05254	0.71553	9.83209
	B0->Y (FR)	0.03447	0.69857	9.82362
	B1->Y (FR)	0.04579	0.68056	9.34999

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)	0.06420	0.56463	7.31161
	A1->Y (RF)	0.05107	0.54652	7.24465
	B0->Y (RF)	0.04325	0.59325	8.13359
	B1->Y (RF)	0.05683	0.61206	8.24922

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	0.01911	0.01977	0.04265
	A1	0.01464	0.01696	0.05221
	B0	0.00886	0.01121	0.04607
	B1	0.01195	0.01276	0.03701

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00168	0.00186	0.01862
	A1	-0.00070	-0.00019	0.01609
	B0	-0.00072	0.00043	0.01911
	B1	0.00169	0.00282	0.02079

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)	-0.00411	-0.00504	-0.00505
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00410	-0.00504	-0.00505
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00497	-0.00506	-0.00505
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00509	-0.00511	-0.00510

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)	0.00503	0.00509	0.00507
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00503	0.00509	0.00507
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00502	0.00506	0.00505
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00510	0.00513	0.00512

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)	-0.00226	-0.00232	-0.00228
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00226	-0.00232	-0.00227
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00494	-0.00503	-0.00500
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00505	-0.00509	-0.00507

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)	0.00235	0.00238	0.00230
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00235	0.00238	0.00230
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00497	0.00503	0.00500
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00506	0.00509	0.00508

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)	-0.00225	-0.00230	-0.00226
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00224	-0.00230	-0.00226
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00552	-0.00562	-0.00558
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00553	-0.00555	-0.00562

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)	0.00233	0.00236	0.00228
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00233	0.00234	0.00228
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00560	0.00565	0.00558
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00561	0.00566	0.00564

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)	-0.00405	-0.00496	-0.00496
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00405	-0.00496	-0.00496
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00563	-0.00574	-0.00570
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00564	-0.00563	-0.00573

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)	0.00494	0.00500	0.00497
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00494	0.00501	0.00498
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00571	0.00576	0.00570
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00572	0.00578	0.00575

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00445	0.00421	2.42102
sky130_osu_sc_15T_ms__or2_2	0.00446	0.00421	4.69159
sky130_osu_sc_15T_ms__or2_4	0.00446	0.00422	8.99611
sky130_osu_sc_15T_ms__or2_8	0.00446	0.00423	17.13199
sky130_osu_sc_15T_ms__or2_l	0.00337	0.00312	1.35950

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.23713	0.38938
sky130_osu_sc_15T_ms__or2_2	0.00000	0.33457	0.77800
sky130_osu_sc_15T_ms__or2_4	0.00000	0.52944	1.55526
sky130_osu_sc_15T_ms__or2_8	0.00000	0.91918	3.10977
sky130_osu_sc_15T_ms__or2_l	0.00000	0.04165	0.06491

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)	0.05529	0.47603	6.36990
	B->Y (RR)	0.04728	0.44938	6.25423
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.06107	0.41854	6.31021
	B->Y (RR)	0.05274	0.39459	6.19347
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.07949	0.41466	6.47286
	B->Y (RR)	0.07100	0.39428	6.34288
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.11620	0.45801	6.71871
	B->Y (RR)	0.10762	0.44324	6.60501
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.06071	0.54917	5.97718
	B->Y (RR)	0.05333	0.52453	5.82945

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)	0.08143	0.53423	6.97294
	B->Y (FF)	0.06734	0.53402	7.24943
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.09546	0.49797	6.97645
	B->Y (FF)	0.08152	0.50284	7.22726
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.13456	0.52124	7.20176
	B->Y (FF)	0.12067	0.53546	7.42867
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.21606	0.60603	7.37316
	B->Y (FF)	0.20222	0.62766	7.57770
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.09409	0.54641	5.81987
	B->Y (FF)	0.07857	0.55001	6.07408

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	0.00825	0.01089	0.08761
	B	0.00000	0.00000	0.00000
	B	0.00601	0.01081	0.10474
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01444	0.01746	0.09608
	B	0.00000	0.00000	0.00000
	B	0.01203	0.01665	0.11115
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02844	0.03209	0.11094
	B	0.00000	0.00000	0.00000
	B	0.02589	0.03123	0.12321
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.06138	0.06281	0.13826
	B	0.00000	0.00000	0.00000
	B	0.05874	0.06229	0.15151
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00591	0.00780	0.05652
	B	0.00000	0.00000	0.00000
	B	0.00448	0.00723	0.06014

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	0.01840	0.02150	0.10043
	B	0.00000	0.00000	0.00000
	B	0.01506	0.02158	0.14633
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.02338	0.02609	0.10557
	B	0.00000	0.00000	0.00000
	B	0.02004	0.02602	0.14897
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03895	0.03803	0.11663
	B	0.00000	0.00000	0.00000
	B	0.03561	0.03813	0.15566
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.08403	0.06353	0.13934
	B	0.00000	0.00000	0.00000
	B	0.08033	0.06401	0.17301
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01348	0.01512	0.07167
	B	0.00000	0.00000	0.00000
	B	0.01122	0.01502	0.09258

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)	-0.00416	-0.00508	-0.00508
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00416	-0.00508	-0.00508
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00416	-0.00508	-0.00508
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00416	-0.00509	-0.00508
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00282	-0.00339	-0.00338

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)	0.00505	0.00512	0.00509
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00505	0.00512	0.00509
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00505	0.00513	0.00509
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00506	0.00513	0.00509
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00336	0.00340	0.00338

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)	-0.00231	-0.00233	-0.00230
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00233	-0.00230
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00233	-0.00230
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00233	-0.00230
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00154	-0.00155	-0.00153

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)	0.00239	0.00242	0.00233
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00239	0.00242	0.00233
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00240	0.00242	0.00233
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00240	0.00242	0.00233
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00159	0.00161	0.00155

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00436	0.00561	1.29552
sky130_osu_sc_15T_ms__tbufi_l	0.00328	0.00427	0.80170

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.19478	0.77726
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.03253	0.12767

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)	0.03029	0.69291	9.83829
	OE->Y (FR)	0.03858	0.36875	5.55659
	OE->Y (RR)	0.05886	0.54381	6.36670
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.03936	0.79928	9.97023
	OE->Y (FR)	0.04331	0.36856	5.55636
	OE->Y (RR)	0.06619	0.63092	6.13026

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)	0.02574	0.54011	7.66115
	OE->Y (FF)	0.03897	0.36877	5.55651
	OE->Y (RF)	0.02465	0.50599	7.09493
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.02815	0.54283	6.78414
	OE->Y (FF)	0.04391	0.36856	5.55633
	OE->Y (RF)	0.02639	0.50338	6.14874

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	0.00790	0.01027	0.04302
	OE	0.00000	0.00000	0.00000
	OE	0.00786	0.01406	0.14940
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00581	0.00725	0.02941
	OE	0.00000	0.00000	0.00000
	OE	0.00550	0.00959	0.09838

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	-0.00144	-0.00013	0.01765
	OE	0.00000	0.00000	0.00000
	OE	0.00482	0.01159	0.16758
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00083	0.00004	0.01408
	OE	0.00000	0.00000	0.00000
	OE	0.00324	0.00772	0.11163

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)	-0.00388	-0.00390	-0.00389
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00336	-0.00341	-0.00338
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00278	-0.00279	-0.00279
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00242	-0.00246	-0.00244

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)	0.00388	0.00390	0.00389
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00343	0.00347	0.00340
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00278	0.00279	0.00279
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00247	0.00249	0.00244

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)	0.00294	0.01018	0.17070
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00259	0.00973	0.17029
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00192	0.00665	0.11221
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00168	0.00636	0.11197

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)	0.00937	0.01822	0.17803
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00932	0.01808	0.17817
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00706	0.01257	0.11759
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00710	0.01260	0.11768

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00435	0.00672	1.29513
sky130_osu_sc_15T_ms__tnbufi_l	0.00328	0.00481	0.80169

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.32420	0.38900
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.05363	0.06437

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)	0.03037	0.69272	9.83607
	OE->Y (RR)	0.02523	0.36933	5.55710
	OE->Y (FR)	0.03941	0.67066	9.29218
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.03951	0.79916	9.96854
	OE->Y (RR)	0.02531	0.36928	5.55702
	OE->Y (FR)	0.04792	0.77433	9.34161

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)	0.02536	0.53992	7.65967
	OE->Y (RF)	0.02517	0.36935	5.55710
	OE->Y (FF)	0.04221	0.44743	5.35966
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.02768	0.54261	6.78406
	OE->Y (RF)	0.02518	0.36926	5.55704
	OE->Y (FF)	0.04804	0.47890	4.91510

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	0.00812	0.01047	0.04323
	OE	0.00000	0.00000	0.00000
	OE	0.02004	0.02918	0.18835
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00604	0.00747	0.02965
	OE	0.00000	0.00000	0.00000
	OE	0.01433	0.02006	0.12450

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	-0.00175	-0.00042	0.01737
	OE	0.00000	0.00000	0.00000
	OE	0.01731	0.02613	0.15993
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00113	-0.00024	0.01380
	OE	0.00000	0.00000	0.00000
	OE	0.01230	0.01795	0.10997

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)	-0.00328	-0.00330	-0.00330
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00282	-0.00286	-0.00283
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00222	-0.00223	-0.00222
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00190	-0.00192	-0.00191

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)	0.00328	0.00330	0.00330
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00287	0.00291	0.00285
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00222	0.00223	0.00222
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00193	0.00194	0.00191

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)	-0.00599	0.00100	0.16217
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00609	0.00105	0.16235
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00385	0.00071	0.10676
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00386	0.00074	0.10676

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)	0.01510	0.02512	0.18618
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01489	0.02454	0.18605
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01074	0.01697	0.12290
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01060	0.01671	0.12278

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00865	0.00775	1.32863

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.66458	1.16625

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	0.07357	0.57223	6.52204
	A->Y (FR)	!B	0.04017	0.70374	9.91086
	B->Y (RR)	A	0.05949	0.56201	6.66116
	B->Y (FR)	!A	0.05483	0.68968	9.46212

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	0.07460	0.50919	5.73615
	A->Y (RF)	!B	0.03537	0.52166	7.26586
	B->Y (FF)	A	0.06382	0.50032	5.74869
	B->Y (RF)	!A	0.04539	0.53323	7.25885

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	0.00790	0.01359	0.15115
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01958	0.02964	0.21858
	B	A	0.00000	0.00000	0.00000
	B	A	0.00244	0.00965	0.17187
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02156	0.03030	0.20637

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	0.02391	0.03116	0.18829
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00485	0.01182	0.18384
	B	A	0.00000	0.00000	0.00000
	B	A	0.02169	0.03047	0.19234
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00654	0.01335	0.18272

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00868	0.00779	1.32010

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.66458	1.10082

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	0.07336	0.57449	6.71563
	A->Y (FR)	B	0.05059	0.69490	9.61697
	B->Y (RR)	!A	0.06276	0.57234	6.74812
	B->Y (FR)	A	0.05593	0.69857	9.57959

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	0.06520	0.50144	5.55669
	A->Y (RF)	B	0.03733	0.55959	7.74560
	B->Y (FF)	!A	0.06173	0.50123	5.74719
	B->Y (RF)	A	0.04511	0.53401	7.23718

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	0.02317	0.03216	0.21065
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00389	0.00886	0.16404
	B	A	0.00000	0.00000	0.00000
	B	A	0.02388	0.03275	0.20568
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00218	0.00898	0.16944

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	0.00398	0.01090	0.18480
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02459	0.03282	0.16554
	B	A	0.00000	0.00000	0.00000
	B	A	0.00408	0.01043	0.17671
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02206	0.03100	0.19119

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_2P10_25C.ccs
Cell Library: Process , Voltage 2.10,
Temp 25.00

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	0.88265
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	466114.00000	932228.00000
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
	-0.00183	0.13414	1.97384

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
	8.11212	7.73938	2.32799