sky130_osu_sc_15T_ms_ss_1P60_150C.ccs Library

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

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.01666	0.01658	0.01272	1.56614	0.75075	1.58608
sky130_osu_sc_15T_ms__addf_l	0.01665	0.01657	0.01271	0.83991	0.75137	0.85838

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	15.95430	19.00440
sky130_osu_sc_15T_ms__addf_l	0.00000	10.07660	13.12660

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)	0.25239	2.38000	31.08400
	B->CO (RR)	0.25804	2.35757	30.59590
	CI->CO (RR)	0.23893	2.41119	31.67560
	CON->CO (FR)	0.03157	0.74967	10.10470
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.27303	2.19689	22.79990
	B->CO (RR)	0.27813	2.18819	22.75700
	CI->CO (RR)	0.25920	2.22724	23.41280
	CON->CO (FR)	0.04768	0.94183	10.88060

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)	0.27735	2.60971	34.17160
	B->CO (FF)	0.25201	2.52980	33.41910
	CI->CO (FF)	0.24746	2.61447	34.70730
	CON->CO (RF)	0.03830	0.86908	11.72540
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.27993	2.18044	22.40150
	B->CO (FF)	0.25440	2.12441	22.24260
	CI->CO (FF)	0.24996	2.18722	22.98510
	CON->CO (RF)	0.04602	0.90214	10.47710

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)	0.18074	0.98733	9.45779
	B->CON (FR)	0.15883	0.96707	9.67744
	CI->CON (FR)	0.15086	0.99539	10.06310
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.17025	0.97742	9.45284
	B->CON (FR)	0.14891	0.95767	9.67274
	CI->CON (FR)	0.14030	0.98547	10.05830

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)	0.18616	1.03346	10.08230
	B->CON (RF)	0.19230	1.05268	10.37450
	CI->CON (RF)	0.17272	1.06600	10.71300
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.17729	1.02536	10.07920
	B->CON (RF)	0.18359	1.04497	10.37180
	CI->CON (RF)	0.16373	1.05781	10.70960

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)	0.40648	2.32260	26.07930
	B->S (-R)	0.40719	2.30200	25.53540
	CI->S (-R)	0.37476	2.32171	26.61360
	CON->S (RR)	0.12383	0.81732	8.13547
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.40181	2.07257	18.95020
	B->S (-R)	0.40041	2.07526	18.99160
	CI->S (-R)	0.36911	2.07322	19.52250
	CON->S (RR)	0.13656	0.95630	8.41745

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)	0.41668	2.34942	25.42970
	B->S (-F)	0.41281	2.27375	24.94400
	CI->S (-F)	0.40269	2.37597	26.02600
	CON->S (FF)	0.14888	0.87258	8.06606
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.40107	2.01204	17.74240
	B->S (-F)	0.39433	1.95989	17.73720
	CI->S (-F)	0.38681	2.03758	18.35760
	CON->S (FF)	0.15183	0.88235	6.76301

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	0.00301	0.00393	0.02014
	B	0.00464	0.00535	0.02027
	CI	0.00466	0.00569	0.02196
sky130_osu_sc_15T_ms__addf_l	A	0.00208	0.00253	0.01035
	B	0.00372	0.00393	0.01117
	CI	0.00372	0.00427	0.01214

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01138	0.01229	0.02978
	B	0.01205	0.01287	0.02828
	CI	0.00957	0.01057	0.02838
sky130_osu_sc_15T_ms__addf_l	A	0.01045	0.01091	0.01969
	B	0.01081	0.01126	0.01908
	CI	0.00865	0.00923	0.01841

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01123	0.01171	0.02024
	B	0.01192	0.01241	0.01973
	CI	0.01056	0.01126	0.01906
sky130_osu_sc_15T_ms__addf_l	A	0.01040	0.01081	0.01869
	B	0.01108	0.01151	0.01825
	CI	0.00970	0.01035	0.01756

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00290	0.00343	0.01141
	B	0.00452	0.00483	0.01224
	CI	0.00455	0.00517	0.01327
sky130_osu_sc_15T_ms__addf_l	A	0.00203	0.00244	0.00944
	B	0.00366	0.00384	0.01038
	CI	0.00367	0.00418	0.01129

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01130	0.01223	0.02979
	B	0.01199	0.01282	0.02834
	CI	0.00950	0.01050	0.02836
sky130_osu_sc_15T_ms__addf_l	A	0.01044	0.01091	0.01976
	B	0.01111	0.01160	0.01922
	CI	0.00864	0.00922	0.01857

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02509	0.02549	0.04038
	B	0.02243	0.02286	0.04085
	CI	0.02032	0.02048	0.03457
sky130_osu_sc_15T_ms__addf_l	A	0.02387	0.02403	0.03938
	B	0.02109	0.02151	0.04007
	CI	0.01899	0.01912	0.03377

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00820	0.00897	1.60920	0.79995	1.61194
sky130_osu_sc_15T_ms__addh_l	0.00820	0.00897	0.86731	0.80125	0.88571

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	16.98110	19.25220
sky130_osu_sc_15T_ms__addh_l	0.00000	9.65266	13.37460

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)	0.16525	0.87656	8.22410
	B->CO (RR)	0.17159	0.85150	8.20788
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.18146	1.02298	8.58654
	B->CO (RR)	0.18771	1.00005	8.54296

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)	0.11975	0.80945	7.86491
	B->CO (FF)	0.12643	0.82762	7.93558
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.12090	0.76047	5.77184
	B->CO (FF)	0.12730	0.77772	5.84059

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	0.21731	0.75676	4.97127
	A->CON (FR)	!B	0.10114	0.92723	9.98025
	B->CON (RR)	A	0.22243	0.72982	4.94584
	B->CON (FR)	!A	0.12450	0.91861	9.48113
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.19828	0.73105	4.94438
	A->CON (FR)	!B	0.09140	0.91784	9.98058
	B->CON (RR)	A	0.20352	0.70619	4.89678
	B->CON (FR)	!A	0.11475	0.90901	9.48165

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	0.21535	0.97548	7.19623
	A->CON (RF)	!B	0.10939	1.01062	10.92640
	B->CON (FF)	A	0.20368	1.00132	7.51470
	B->CON (RF)	!A	0.13877	1.02140	10.71370
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.19899	0.94428	7.08576
	A->CON (RF)	!B	0.10082	0.99988	10.92690
	B->CON (FF)	A	0.18721	0.97094	7.40566
	B->CON (RF)	!A	0.13029	1.01350	10.71530

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	0.16994	2.33550	32.02870
	A->S (FR)	B	0.27752	2.29094	28.19540
	B->S (RR)	!A	0.20080	2.32127	31.31750
	B->S (FR)	A	0.26479	2.34322	29.01450
	CON->S (FR)	-	0.03386	0.77016	10.46180
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.18279	2.14183	23.87350
	A->S (FR)	B	0.28333	2.08220	19.92630
	B->S (RR)	!A	0.21441	2.14231	23.44080
	B->S (FR)	A	0.26991	2.12321	20.46200
	CON->S (FR)	-	0.04775	0.95445	11.18950

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	0.18124	2.44954	33.71480
	A->S (RF)	B	0.28264	1.83976	21.33590
	B->S (FF)	!A	0.20469	2.44603	33.29400
	B->S (RF)	A	0.28770	1.81384	21.32310
	CON->S (RF)	-	0.03672	0.86014	11.74620
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.18116	2.06876	22.91140
	A->S (RF)	B	0.27056	1.62381	14.91410
	B->S (FF)	!A	0.20450	2.06257	22.43600
	B->S (RF)	A	0.27564	1.59986	14.86560
	CON->S (RF)	-	0.04403	0.90738	10.69840

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	0.00529	0.00534	0.01114
	B	0.00000	0.00000	0.00000
	B	0.00473	0.00463	0.01112
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00451	0.00451	0.01088
	B	0.00000	0.00000	0.00000
	B	0.00395	0.00380	0.01046

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	0.00812	0.00834	0.01837
	B	0.00000	0.00000	0.00000
	B	0.00838	0.00903	0.01960
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00733	0.00735	0.01519
	B	0.00000	0.00000	0.00000
	B	0.00758	0.00798	0.01601

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	0.00522	0.00527	0.01104
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00711	0.00744	0.01106
	B	A	0.00000	0.00000	0.00000
	B	A	0.00466	0.00457	0.01131
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00804	0.00819	0.01114
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00445	0.00445	0.01074
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00647	0.00668	0.00924
	B	A	0.00000	0.00000	0.00000
	B	A	0.00389	0.00374	0.01048
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00739	0.00743	0.00934

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	0.00811	0.00826	0.01696
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00152	0.00173	0.00522
	B	A	0.00000	0.00000	0.00000
	B	A	0.00836	0.00891	0.01803
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00221	0.00231	0.00564
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00734	0.00736	0.01524
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00074	0.00083	0.00266
	B	A	0.00000	0.00000	0.00000
	B	A	0.00760	0.00799	0.01606
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00142	0.00137	0.00324

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	0.00822	0.00844	0.01857
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00171	0.00208	0.00739
	B	A	0.00000	0.00000	0.00000
	B	A	0.00849	0.00915	0.01986
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00238	0.00261	0.00756
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00738	0.00742	0.01529
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00082	0.00092	0.00276
	B	A	0.00000	0.00000	0.00000
	B	A	0.00765	0.00806	0.01617
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00149	0.00146	0.00321

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	0.00537	0.00542	0.01162
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00725	0.00769	0.01210
	B	A	0.00000	0.00000	0.00000
	B	A	0.00480	0.00470	0.01167
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00818	0.00848	0.01244
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00452	0.00452	0.01113
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00648	0.00669	0.00922
	B	A	0.00000	0.00000	0.00000
	B	A	0.00396	0.00381	0.01058
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00741	0.00748	0.00933

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00439	0.00450	1.62444
sky130_osu_sc_15T_ms__and2_2	0.00439	0.00450	3.20792
sky130_osu_sc_15T_ms__and2_4	0.00439	0.00450	6.19266
sky130_osu_sc_15T_ms__and2_6	0.00442	0.00450	9.20034
sky130_osu_sc_15T_ms__and2_8	0.00440	0.00451	11.91474
sky130_osu_sc_15T_ms__and2_l	0.00323	0.00335	0.84386

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	7.95375	12.46070
sky130_osu_sc_15T_ms__and2_2	0.00000	12.46960	12.50710
sky130_osu_sc_15T_ms__and2_4	0.00000	21.76030	24.86160
sky130_osu_sc_15T_ms__and2_6	0.00000	31.05090	37.21610
sky130_osu_sc_15T_ms__and2_8	0.00000	40.34150	49.57050
sky130_osu_sc_15T_ms__and2_l	0.00000	0.63952	0.83896

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)	0.12501	0.78918	8.08060
	B->Y (RR)	0.13376	0.77400	7.93080
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.14641	0.76018	8.25191
	B->Y (RR)	0.15535	0.73648	8.10131
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.20303	0.81200	8.60314
	B->Y (RR)	0.21194	0.77945	8.43196
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.25972	0.87855	8.93966
	B->Y (RR)	0.26843	0.84360	8.74111
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.31513	0.94279	9.15432
	B->Y (RR)	0.32398	0.90865	8.93803
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.16588	0.99174	8.36590
	B->Y (RR)	0.17617	0.97664	8.25684

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)	0.09388	0.72531	7.48934
	B->Y (FF)	0.09767	0.74322	7.56960
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.10489	0.66785	7.63009
	B->Y (FF)	0.10928	0.68545	7.70178
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.14388	0.68999	7.88249
	B->Y (FF)	0.14796	0.69955	7.94141
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.18593	0.73967	8.16144
	B->Y (FF)	0.18948	0.74682	8.21647
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.22569	0.78489	8.21528
	B->Y (FF)	0.22892	0.79014	8.27465
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.12466	0.83280	6.49763
	B->Y (FF)	0.13216	0.85719	6.58923

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	0.00418	0.00465	0.02697
	B	0.00000	0.00000	0.00000
	B	0.00425	0.00413	0.02103
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00811	0.00873	0.02999
	B	0.00000	0.00000	0.00000
	B	0.00819	0.00826	0.02451
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01728	0.01768	0.03732
	B	0.00000	0.00000	0.00000
	B	0.01736	0.01722	0.03246
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02736	0.02645	0.04635
	B	0.00000	0.00000	0.00000
	B	0.02746	0.02653	0.04079
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03881	0.03658	0.05430
	B	0.00000	0.00000	0.00000
	B	0.03845	0.03570	0.05108
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00279	0.00283	0.01355
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00259	0.01065

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	0.00975	0.01099	0.03351
	B	0.00000	0.00000	0.00000
	B	0.01097	0.01199	0.03369
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01229	0.01402	0.03620
	B	0.00000	0.00000	0.00000
	B	0.01355	0.01498	0.03644
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01895	0.02136	0.04294
	B	0.00000	0.00000	0.00000
	B	0.02017	0.02218	0.04314
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02601	0.02866	0.05005
	B	0.00000	0.00000	0.00000
	B	0.02724	0.02926	0.05008
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03366	0.03577	0.05732
	B	0.00000	0.00000	0.00000
	B	0.03494	0.03626	0.05687
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00714	0.00758	0.01810
	B	0.00000	0.00000	0.00000
	B	0.00798	0.00828	0.01838

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)	-0.00356	-0.00358	-0.00359
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00352	-0.00354
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00339	-0.00342	-0.00343
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00331	-0.00333	-0.00335
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00318	-0.00320	-0.00322
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00248	-0.00250	-0.00251

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)	0.00370	0.00373	0.00371
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00375	0.00379	0.00377
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00386	0.00389	0.00388
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00399	0.00402	0.00401
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00408	0.00410	0.00409
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00251	0.00254	0.00252

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)	-0.00342	-0.00342	-0.00341
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00336	-0.00337	-0.00336
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00326	-0.00326	-0.00326
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00315	-0.00316	-0.00315
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00304	-0.00305	-0.00304
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00240	-0.00240	-0.00240

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)	0.00357	0.00357	0.00354
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00362	0.00362	0.00359
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00373	0.00375	0.00370
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00384	0.00386	0.00381
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00395	0.00396	0.00391
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00243	0.00245	0.00241

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00417	0.00433	0.00417	0.72572

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	3.51752	7.46192

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)	0.09748	0.90730	9.32320
	A1->Y (FR)	0.08290	0.86399	9.03745
	B0->Y (FR)	0.07072	0.91674	9.92295

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)	0.10545	0.91804	9.51540
	A1->Y (RF)	0.09774	0.94837	10.08150
	B0->Y (RF)	0.05617	0.86742	9.69678

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	0.00864	0.00861	0.01169
	A1	0.00000	0.00000	0.00000
	A1	0.00732	0.00730	0.01039
	B0	0.00527	0.00548	0.00908

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	0.00224	0.00194	0.00443
	A1	0.00000	0.00000	0.00000
	A1	0.00227	0.00210	0.00492
	B0	-0.00077	-0.00070	0.00164

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)	-0.00252	-0.00306	-0.00316
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00319	-0.00321	-0.00319
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00325	-0.00325	-0.00324

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)	0.00328	0.00331	0.00329
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00329	0.00333	0.00331
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00329	0.00329	0.00326

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)	-0.00251	-0.00304	-0.00312
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00315	-0.00315	-0.00314
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00340	-0.00341	-0.00345

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)	0.00322	0.00326	0.00325
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00325	0.00327	0.00326
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00344	0.00348	0.00346

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)	-0.00146	-0.00148	-0.00147

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)	0.00169	0.00170	0.00155

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00417	0.00430	0.00445	0.00425	0.73641

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_l	0.00000	3.91128	12.35060

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)	0.11865	0.92670	9.32004
	A1->Y (FR)	0.10637	0.90620	9.23700
	B0->Y (FR)	0.07203	0.90082	9.82103
	B1->Y (FR)	0.08433	0.92843	9.94795

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)	0.14259	0.96175	9.64305
	A1->Y (RF)	0.13474	0.99204	10.20790
	B0->Y (RF)	0.06682	0.91910	10.14110
	B1->Y (RF)	0.07481	0.88845	9.57662

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	0.01061	0.01055	0.01351
	A1	0.00931	0.00923	0.01225
	B0	0.00574	0.00602	0.01095
	B1	0.00701	0.00698	0.01214

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00442	0.00410	0.00661
	A1	0.00444	0.00421	0.00712
	B0	-0.00034	-0.00023	0.00264
	B1	-0.00026	-0.00036	0.00215

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)	-0.00235	-0.00299	-0.00311
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00314	-0.00316	-0.00314
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00325	-0.00326	-0.00324
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00325	-0.00326	-0.00324

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)	0.00334	0.00335	0.00335
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00335	0.00338	0.00336
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00329	0.00329	0.00326
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00329	0.00329	0.00326

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)	-0.00232	-0.00296	-0.00306
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00309	-0.00310	-0.00309
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00339	-0.00342	-0.00344
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00339	-0.00343	-0.00344

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)	0.00328	0.00329	0.00330
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00330	0.00332	0.00331
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00345	0.00347	0.00345
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00345	0.00347	0.00345

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)	-0.00147	-0.00149	-0.00148
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00137	-0.00138	-0.00140
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00350	-0.00353	-0.00355
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00350	-0.00353	-0.00355

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)	0.00177	0.00178	0.00158
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00152	0.00153	0.00153
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00356	0.00360	0.00356
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00356	0.00360	0.00356

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)	-0.00148	-0.00150	-0.00149
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00138	-0.00140	-0.00141
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00329	-0.00330	-0.00330
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00329	-0.00330	-0.00330

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)	0.00178	0.00179	0.00159
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00153	0.00154	0.00154
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00334	0.00334	0.00331
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00334	0.00334	0.00331

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00449	1.62558
sky130_osu_sc_15T_ms__buf_2	0.00453	3.05242
sky130_osu_sc_15T_ms__buf_4	0.00452	5.89472
sky130_osu_sc_15T_ms__buf_6	0.00092	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00453	11.63163
sky130_osu_sc_15T_ms__buf_l	0.00337	0.84486

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	6.43779	6.43785
sky130_osu_sc_15T_ms__buf_2	0.00000	9.44596	12.46140
sky130_osu_sc_15T_ms__buf_4	0.00000	15.67300	24.81590
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	28.12690	49.52480
sky130_osu_sc_15T_ms__buf_l	0.00000	0.56011	0.56011

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)**	0.08510	0.72923	7.84646
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.09800	0.67173	7.63250
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.13245	0.69525	7.91296
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.19877	0.78255	8.50385
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.11189	0.91253	8.03928

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)**	0.08929	0.71646	7.54416
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.10223	0.66512	7.58208
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.14155	0.69024	7.90851
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.22353	0.78974	8.47429
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.12060	0.82547	6.53253

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	0.00379	0.00429	0.02362
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00758	0.00814	0.02631
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01618	0.01723	0.03588
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03466	0.03541	0.05261
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00272	0.00275	0.01254

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	0.00942	0.01070	0.03393
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01203	0.01359	0.03556
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01863	0.02083	0.04234
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03340	0.03507	0.05642
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00698	0.00735	0.01836

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
	-0.00061	-0.00061	-0.00058

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
	0.00061	0.00061	0.00058

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00428	0.00425	0.01238	1.54030	1.53028
sky130_osu_sc_15T_ms__dffr_l	0.00428	0.00425	0.01238	0.84406	0.84733

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	19.29630	33.56290
sky130_osu_sc_15T_ms__dffr_l	0.00000	13.41860	27.68530

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)	0.51337	2.00911	20.05090
	QN->Q (FR)	0.03873	0.88180	11.88450
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.52533	2.23317	18.89110
	QN->Q (FR)	0.05124	1.00860	11.67810

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)	0.46343	2.01422	21.01890
	QN->Q (RF)	0.04183	0.93393	12.57830
	RN->Q (FF)	0.33825	1.83143	19.87310
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.49759	2.30064	20.03920
	QN->Q (RF)	0.04809	0.95105	11.06890
	RN->Q (FF)	0.37412	2.11867	18.89430

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)	0.40173	1.09225	8.17163
	RN->QN (FR)	0.27628	0.91010	7.03145
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.41869	1.24173	8.47669
	RN->QN (FR)	0.29417	1.06019	7.33214

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)**	0.45755	1.21073	8.93081
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.44677	1.21596	7.77261

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)	-0.15212	-0.15471	-0.17474
	setup	CK (R)	0.41829	0.41400	0.68288
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.15699	-0.15566	-0.17364
	setup	CK (R)	0.41291	0.41168	0.68877

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)	-0.15948	-0.34974	-1.30844
	setup	CK (R)	0.20106	0.36482	1.33321
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.16060	-0.34778	-1.30914
	setup	CK (R)	0.19924	0.36482	1.33147

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)	-0.15212	-0.15471	-0.17474
	setup	CK (R)	0.41829	0.41400	0.68288
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.15699	-0.15566	-0.17364
	setup	CK (R)	0.41291	0.41168	0.68877

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)	-0.15948	-0.34974	-1.30844
	setup	CK (R)	0.20106	0.36482	1.33321
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.16060	-0.34778	-1.30914
	setup	CK (R)	0.19924	0.36482	1.33147

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)	0.33328	0.34877	0.93697
	removal	CK (R)	-0.09926	-0.11344	-0.22291
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.33099	0.34664	0.94128
	removal	CK (R)	-0.09926	-0.11344	-0.22291

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)	0.33328	0.34877	0.93697
	removal	CK (R)	-0.09926	-0.11344	-0.22291
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.33099	0.34664	0.94128
	removal	CK (R)	-0.09926	-0.11344	-0.22291

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 ()	0.19264	0.56274	13.33370
	min_pulse_width	RN ()	0.19264	0.56274	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.19895	0.56274	13.33370
	min_pulse_width	RN ()	0.19685	0.56274	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 ()	0.26414	0.56274	13.33370
	min_pulse_width	CK ()	0.24942	0.56274	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.24521	0.56274	13.33370
	min_pulse_width	CK ()	0.24101	0.56274	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 ()	0.49125	0.56274	13.33370
	min_pulse_width	CK ()	0.17582	0.56274	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.48914	0.56274	13.33370
	min_pulse_width	CK ()	0.17372	0.56274	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	0.00987	0.00930	0.01522
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00853	0.00837	0.02280

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	0.01115	0.00956	-0.00142
	RN	-0.00122	-0.06770	-0.98577
	RN	0.02484	0.02350	0.01336
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00982	0.00921	0.01449
	RN	-0.00122	-0.04719	-0.54019
	RN	0.02352	0.02314	0.02892

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	0.01104	0.00946	-0.00142
	RN	-0.00122	-0.06744	-0.97763
	RN	0.02476	0.02342	0.01294
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00977	0.00917	0.01445
	RN	-0.00122	-0.04730	-0.54203
	RN	0.02348	0.02308	0.02879

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	0.00973	0.00916	0.01502
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00839	0.00822	0.02223

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	-0.00228	-0.00280	-0.00289
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01182	0.01142	0.02692
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00512	0.00478	0.02044
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00233	-0.00285	-0.00295
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01177	0.01137	0.02687
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00507	0.00473	0.02039

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	0.00350	0.00352	0.00351
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01942	0.01935	0.03606
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00931	0.00933	0.02585
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00345	0.00346	0.00346
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01937	0.01930	0.03601
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00926	0.00928	0.02580

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)	0.00346	0.00378	0.02746
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01021	0.01033	0.03398
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)	0.00340	0.00373	0.02741
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01015	0.01027	0.03393

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)	0.00889	0.00979	0.03481
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01873	0.01927	0.04408
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)	0.00884	0.00974	0.03476
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01868	0.01922	0.04403

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)	-0.00059	-0.00052	0.02300
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00553	0.00526	0.02974
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00095	-0.00088	0.02245
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00065	-0.00057	0.02295
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00548	0.00521	0.02969
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00101	-0.00093	0.02240

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)	0.01359	0.01447	0.03961
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02937	0.02939	0.05687
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02243	0.02295	0.04787
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02887	0.03030	0.07323
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01558	0.01642	0.04105
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01354	0.01444	0.03956
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02932	0.02934	0.05682
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02238	0.02290	0.04782
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02882	0.03025	0.07318
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01553	0.01637	0.04100

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00424	0.00426	0.00933	0.01262	1.54646	1.54274
sky130_osu_sc_15T_ms__dffsr_l	0.00424	0.00426	0.00931	0.01262	0.84119	0.84637

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	25.22120	34.38310
sky130_osu_sc_15T_ms__dffsr_l	0.00000	19.34350	28.50530

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)	0.45354	1.91075	19.54460
	QN->Q (FR)	0.03431	0.80117	10.77910
	RN->Q (RR)	0.36306	1.84118	19.50440
	SN->Q (FR)	0.31148	1.72589	18.53460
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.48027	2.18296	18.76430
	QN->Q (FR)	0.05123	1.00659	11.63850
	RN->Q (RR)	0.39027	2.11280	18.71540
	SN->Q (FR)	0.33849	1.99571	17.74160

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)	0.54374	2.05509	20.36410
	QN->Q (RF)	0.04131	0.93680	12.64130
	RN->Q (FF)	0.34890	1.80603	19.19540
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.58740	2.39758	20.07810
	QN->Q (RF)	0.04800	0.94903	11.03970
	RN->Q (FF)	0.39276	2.14875	18.91350

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)	0.48137	1.15463	7.82478
	RN->QN (FR)	0.28689	0.90727	6.66653
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.50624	1.34053	8.57505
	RN->QN (FR)	0.31203	1.09337	7.41253

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)	0.40321	1.14988	8.92563
	RN->QN (RF)	0.31302	1.08078	8.88528
	SN->QN (FF)	0.26155	0.96559	7.91933
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.40503	1.16890	7.70677
	RN->QN (RF)	0.31505	1.10060	7.66287
	SN->QN (FF)	0.26343	0.98197	6.68632

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)	-0.13865	-0.14336	-0.17926
	setup	CK (R)	0.34773	0.35163	0.70945
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13892	-0.14375	-0.18062
	setup	CK (R)	0.34742	0.34816	0.70387

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)	-0.18551	-0.37523	-1.41037
	setup	CK (R)	0.25128	0.39041	1.43113
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.18818	-0.37597	-1.41035
	setup	CK (R)	0.24934	0.39041	1.43088

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)	-0.13865	-0.14336	-0.17926
	setup	CK (R)	0.34773	0.35163	0.70945
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13892	-0.14375	-0.18062
	setup	CK (R)	0.34742	0.34816	0.70387

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)	-0.18551	-0.37523	-1.41037
	setup	CK (R)	0.25128	0.39041	1.43113
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.18818	-0.37597	-1.41035
	setup	CK (R)	0.24934	0.39041	1.43088

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)	0.23939	0.26090	0.85011
	removal	CK (R)	-0.03509	-0.03730	-0.08294
	hold	SN (R)	-0.25462	-0.45913	-1.74468
	setup	SN (R)	0.29177	0.51772	3.11929
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.23740	0.25654	0.84705
	removal	CK (R)	-0.03509	-0.03730	-0.08397
	hold	SN (R)	-0.25505	-0.45428	-1.68027
	setup	SN (R)	0.29113	0.50947	3.04556

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)	0.23939	0.26090	0.85011
	removal	CK (R)	-0.03509	-0.03730	-0.08294
	hold	SN (R)	-0.25462	-0.45913	-1.74468
	hold	SN (R)	-0.25751	-0.46181	-1.75393
	setup	SN (R)	0.29177	0.51403	2.96000
	setup	SN (R)	0.29101	0.51772	3.11929
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.23740	0.25654	0.84705
	removal	CK (R)	-0.03509	-0.03730	-0.08397
	hold	SN (R)	-0.25505	-0.45428	-1.68027
	hold	SN (R)	-0.25599	-0.45465	-1.68930
	setup	SN (R)	0.29113	0.50687	2.89297
	setup	SN (R)	0.27913	0.50947	3.04556

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 ()	0.22418	0.56274	13.33370
	min_pulse_width	RN ()	0.22839	0.56274	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.22629	0.56274	13.33370
	min_pulse_width	RN ()	0.22418	0.56274	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)	0.08957	0.12108	2.30635
	removal	CK (R)	-0.04010	-0.08997	-0.40654
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.08630	0.11976	2.22766
	removal	CK (R)	-0.04010	-0.08997	-0.40551

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)	0.08957	0.12108	2.30635
	removal	CK (R)	-0.04010	-0.08997	-0.40654
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.08630	0.11976	2.22766
	removal	CK (R)	-0.04010	-0.08997	-0.40551

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 ()	0.23891	0.56274	13.33370
	min_pulse_width	SN ()	0.24311	0.56274	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.23680	0.56274	13.33370
	min_pulse_width	SN ()	0.22839	0.56274	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 ()	0.21788	0.56274	13.33370
	min_pulse_width	CK ()	0.26835	0.56274	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.21157	0.56274	13.33370
	min_pulse_width	CK ()	0.26204	0.56274	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 ()	0.42396	0.56274	13.33370
	min_pulse_width	CK ()	0.23049	0.56274	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.41975	0.56274	13.33370
	min_pulse_width	CK ()	0.22629	0.56274	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	0.01230	0.01170	0.01702
	RN	0.02217	0.02148	0.02045
	SN	-0.00122	-0.06786	-0.98972
	SN	0.02464	0.02359	0.02339
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01112	0.01093	0.02511
	RN	0.02097	0.02071	0.02856
	SN	-0.00122	-0.04709	-0.53836
	SN	0.02345	0.02282	0.03198

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	0.01331	0.01258	0.01240
	RN	-0.00122	-0.06786	-0.98971
	RN	0.02604	0.02534	0.02536
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01203	0.01152	0.01689
	RN	-0.00122	-0.04709	-0.53836
	RN	0.02477	0.02425	0.03080

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	0.01310	0.01238	0.01154
	RN	-0.00122	-0.06777	-0.98371
	RN	0.02591	0.02519	0.02517
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01193	0.01142	0.01671
	RN	-0.00122	-0.04727	-0.54142
	RN	0.02471	0.02421	0.03038

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	0.01218	0.01158	0.01666
	RN	0.02205	0.02136	0.02015
	SN	-0.00122	-0.06776	-0.98726
	SN	0.02452	0.02348	0.02339
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01097	0.01079	0.02457
	RN	0.02083	0.02055	0.02815
	SN	-0.00122	-0.04727	-0.54162
	SN	0.02330	0.02269	0.03174

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	-0.00289	-0.00290	-0.00290
	(!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)	0.01523	0.01486	0.03033
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00600	0.00567	0.02112
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00601	0.00569	0.02118
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00607	0.00574	0.02119
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00294	-0.00295	-0.00295
	(!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)	0.01518	0.01481	0.03028
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00595	0.00562	0.02107
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00596	0.00564	0.02113
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00601	0.00569	0.02114

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	0.00352	0.00351	0.00349
	(!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)	0.02257	0.02246	0.03884
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00988	0.00995	0.02633
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01015	0.01012	0.02640
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00985	0.00992	0.02632
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00347	0.00346	0.00344
	(!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)	0.02251	0.02240	0.03878
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00982	0.00989	0.02627
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01009	0.01006	0.02634
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00979	0.00986	0.02626

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)	0.00324	0.00343	0.02691
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01260	0.01258	0.03642
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)	0.00319	0.00338	0.02686
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01255	0.01253	0.03637

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)	0.00948	0.01046	0.03568
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01978	0.02024	0.04540
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)	0.00941	0.01040	0.03562
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01972	0.02017	0.04534

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)	-0.00690	-0.00697	-0.00699
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00613	-0.00718	-0.00738
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00640	-0.00690	-0.00702
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00536	0.00527	0.02103
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)	-0.00695	-0.00702	-0.00704
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00617	-0.00722	-0.00742
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00645	-0.00704	-0.00706
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00532	0.00522	0.02099

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)	0.00747	0.00755	0.00750
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00783	0.00792	0.00789
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00752	0.00761	0.00757
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01566	0.01545	0.03114
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)	0.00742	0.00750	0.00745
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00776	0.00785	0.00783
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00747	0.00756	0.00751
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01560	0.01539	0.03108

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)	-0.00059	-0.00052	0.02300
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00651	0.00632	0.03066
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00623	0.00606	0.03052
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00069	-0.00064	0.02273
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00421	0.00413	0.04804
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00064	-0.00057	0.02295
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00645	0.00626	0.03060
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00617	0.00599	0.03046
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00074	-0.00069	0.02268
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00416	0.00408	0.04799

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)	0.03313	0.03321	0.06084
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01364	0.01458	0.03965
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02313	0.02374	0.04861
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02317	0.02378	0.04860
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03197	0.03314	0.07623
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01561	0.01645	0.04107
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01830	0.01989	0.06619
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03308	0.03315	0.06079
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01359	0.01453	0.03960
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02308	0.02368	0.04856
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02312	0.02372	0.04855
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03191	0.03308	0.07617
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01556	0.01640	0.04102
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01824	0.01983	0.06613

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00426	0.00719	0.01241	1.52515	1.54025
sky130_osu_sc_15T_ms__dffs_l	0.00426	0.00719	0.01241	0.84297	0.84669

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	17.28390	27.29380
sky130_osu_sc_15T_ms__dffs_l	0.00000	11.40630	21.41620

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)	0.39418	1.85690	19.68740
	QN->Q (FR)	0.03867	0.87521	11.75230
	SN->Q (FR)	0.28475	1.80127	19.08690
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.41334	2.10122	18.71670
	QN->Q (FR)	0.05120	1.00619	11.63820
	SN->Q (FR)	0.30275	2.03555	18.06110

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)	0.55257	2.11865	20.89990
	QN->Q (RF)	0.04163	0.92941	12.46870
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.58675	2.40324	20.09370
	QN->Q (RF)	0.04792	0.94827	11.04500

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)	0.48574	1.20497	8.30341
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.50276	1.34482	8.56126

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)	0.34292	1.07115	8.82543
	SN->QN (FF)	0.23270	1.01638	8.22955
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.34012	1.08773	7.63281
	SN->QN (FF)	0.22897	1.02330	6.97998

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)	-0.12681	-0.13010	-0.15386
	setup	CK (R)	0.30131	0.31048	0.63988
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12807	-0.13242	-0.15435
	setup	CK (R)	0.29937	0.30708	0.63596

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)	-0.17663	-0.35291	-1.32843
	setup	CK (R)	0.25583	0.37139	1.35423
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.17722	-0.35137	-1.32963
	setup	CK (R)	0.25134	0.36866	1.35422

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)	-0.12681	-0.13010	-0.15386
	setup	CK (R)	0.30131	0.31048	0.63988
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12807	-0.13242	-0.15435
	setup	CK (R)	0.29937	0.30708	0.63596

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)	-0.17663	-0.35291	-1.32843
	setup	CK (R)	0.25583	0.37139	1.35423
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.17722	-0.35137	-1.32963
	setup	CK (R)	0.25134	0.36866	1.35422

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)	0.10938	0.14256	1.34618
	removal	CK (R)	-0.05626	-0.10693	-0.31330
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.10766	0.14015	1.29043
	removal	CK (R)	-0.05598	-0.10757	-0.30981

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)	0.10938	0.14256	1.34618
	removal	CK (R)	-0.05626	-0.10693	-0.31330
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.10766	0.14015	1.29043
	removal	CK (R)	-0.05598	-0.10757	-0.30981

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 ()	0.19264	0.56274	13.33370
	min_pulse_width	SN ()	0.19895	0.56274	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.19264	0.56274	13.33370
	min_pulse_width	SN ()	0.18844	0.56274	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 ()	0.19475	0.56274	13.33370
	min_pulse_width	CK ()	0.27886	0.56274	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.18633	0.56274	13.33370
	min_pulse_width	CK ()	0.26624	0.56274	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 ()	0.37559	0.56274	13.33370
	min_pulse_width	CK ()	0.23891	0.56274	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.37349	0.56274	13.33370
	min_pulse_width	CK ()	0.23470	0.56274	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	0.00971	0.00922	0.01540
	SN	-0.00122	-0.06730	-0.97609
	SN	0.02037	0.01939	0.01634
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00840	0.00828	0.02274
	SN	-0.00122	-0.04715	-0.53950
	SN	0.01906	0.01846	0.02385

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	0.01098	0.00950	-0.00042
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00964	0.00911	0.01466

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	0.01090	0.00941	-0.00106
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00960	0.00907	0.01449

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	0.00960	0.00911	0.01503
	SN	-0.00122	-0.06770	-0.98567
	SN	0.02026	0.01927	0.01613
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00830	0.00818	0.02215
	SN	-0.00122	-0.04728	-0.54183
	SN	0.01895	0.01835	0.02351

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	-0.00310	-0.00311	-0.00312
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01105	0.01067	0.02641
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00503	0.00469	0.02033
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00315	-0.00316	-0.00317
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01100	0.01062	0.02647
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00498	0.00463	0.02027

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	0.00339	0.00338	0.00336
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01880	0.01867	0.03522
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00939	0.00945	0.02602
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00334	0.00333	0.00331
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01875	0.01862	0.03517
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00934	0.00940	0.02597

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)	-0.00485	-0.00488	-0.00489
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00423	0.00391	0.01302
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)	-0.00490	-0.00493	-0.00494
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00418	0.00385	0.01298

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)	0.00529	0.00534	0.00528
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01059	0.01046	0.02030
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)	0.00524	0.00528	0.00523
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01053	0.01041	0.02025

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)	-0.00067	-0.00059	0.02294
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00096	-0.00083	0.02247
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00318	0.00318	0.04750
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00072	-0.00064	0.02289
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00101	-0.00093	0.02241
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00313	0.00313	0.04745

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)	0.02895	0.02901	0.05692
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01355	0.01444	0.03959
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02820	0.02948	0.07240
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01548	0.01632	0.04096
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01773	0.01937	0.06595
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02890	0.02896	0.05687
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01350	0.01439	0.03953
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02815	0.02943	0.07234
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01543	0.01626	0.04091
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01768	0.01932	0.06590

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00442	0.01237	1.55048	1.54781
sky130_osu_sc_15T_ms__dff_l	0.00442	0.01237	0.78778	0.79133

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	22.04850	27.31820
sky130_osu_sc_15T_ms__dff_l	0.00000	16.17070	21.44050

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)	0.31293	1.74748	19.37970
	QN->Q (FR)	0.03413	0.79831	10.76460
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.34524	2.00207	17.85740
	QN->Q (FR)	0.05602	1.05626	11.99840

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)	0.42359	1.91598	20.23900
	QN->Q (RF)	0.04116	0.93552	12.63970
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.47050	2.25893	19.39370
	QN->Q (RF)	0.04811	0.92622	10.63580

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)	0.36532	1.01741	7.68590
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.39163	1.21997	8.37057

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)	0.26666	0.98812	8.75598
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.27194	0.99337	7.13089

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)	-0.10290	-0.11067	-0.11557
	setup	CK (R)	0.22368	0.24049	0.61797
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.10305	-0.11285	-0.11651
	setup	CK (R)	0.22371	0.23514	0.61195

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)	-0.14747	-0.35289	-1.35913
	setup	CK (R)	0.17910	0.36539	1.37804
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.14872	-0.35406	-1.35928
	setup	CK (R)	0.17453	0.36539	1.37804

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 ()	0.15269	0.56274	13.33370
	min_pulse_width	CK ()	0.23260	0.56274	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.14848	0.56274	13.33370
	min_pulse_width	CK ()	0.22629	0.56274	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 ()**	0.29989	0.56274	13.33370
	min_pulse_width	**CK ()**	0.14428	0.56274	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.29568	0.56274	13.33370
	min_pulse_width	**CK ()**	0.14428	0.56274	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	0.01032	0.00974	0.01565
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00916	0.00901	0.02402

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	0.01138	0.01065	0.01092
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01012	0.00920	0.01129

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	0.01123	0.01050	0.01017
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01006	0.00915	0.01122

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	0.01023	0.00967	0.01544
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00905	0.00894	0.02365

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	-0.00233	-0.00285	-0.00294
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01080	0.01049	0.02711
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00238	-0.00290	-0.00299
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01075	0.01044	0.02706

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	0.00343	0.00345	0.00344
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01956	0.01944	0.03636
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00338	0.00340	0.00339
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01951	0.01937	0.03634

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)	-0.00067	-0.00058	0.02296
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00085	-0.00077	0.02260
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00072	-0.00063	0.02291
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00090	-0.00082	0.02255

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)	0.01348	0.01435	0.03952
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02870	0.02880	0.05723
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02870	0.03001	0.07369
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01549	0.01634	0.04099
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01343	0.01430	0.03947
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02865	0.02875	0.05718
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02865	0.02997	0.07364
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01544	0.01629	0.04094

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00430	1.51640
sky130_osu_sc_15T_ms__inv_10	0.03995	14.10163
sky130_osu_sc_15T_ms__inv_2	0.00818	2.98479
sky130_osu_sc_15T_ms__inv_3	0.01218	4.28945
sky130_osu_sc_15T_ms__inv_4	0.01609	5.73574
sky130_osu_sc_15T_ms__inv_6	0.02412	8.57045
sky130_osu_sc_15T_ms__inv_8	0.03204	11.29056
sky130_osu_sc_15T_ms__inv_l	0.00313	0.75413

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	3.21886	6.33102
sky130_osu_sc_15T_ms__inv_10	0.00000	31.13420	61.77100
sky130_osu_sc_15T_ms__inv_2	0.00000	6.22696	12.35440
sky130_osu_sc_15T_ms__inv_3	0.00000	9.44572	18.68530
sky130_osu_sc_15T_ms__inv_4	0.00000	12.45380	24.70870
sky130_osu_sc_15T_ms__inv_6	0.00000	18.68070	37.06290
sky130_osu_sc_15T_ms__inv_8	0.00000	24.90750	49.41710
sky130_osu_sc_15T_ms__inv_l	0.00000	0.28005	0.48525

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)**	0.03289	0.75160	10.06350
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.04176	0.48823	10.04330
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02638	0.64365	9.96439
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02858	0.59955	9.92903
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02871	0.56299	9.88805
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.03174	0.52441	9.94884
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03641	0.50010	9.93740
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.05056	0.93634	10.53000

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)**	0.03800	0.85769	11.50950
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.04836	0.57267	11.43560
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.03006	0.73528	11.43300
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.03226	0.68935	11.43890
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.03153	0.65245	11.39200
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.03698	0.61412	11.45550
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.04249	0.58858	11.42020
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.04544	0.86580	9.85967

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	0.00498	0.00535	0.00905
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04267	0.04970	0.08572
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00882	0.00990	0.01694
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01352	0.01512	0.02610
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01734	0.01989	0.03400
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02578	0.02984	0.05095
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03424	0.04003	0.06817
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00364	0.00373	0.00554

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	-0.00094	-0.00073	0.00145
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01615	-0.01198	0.01123
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00308	-0.00232	0.00200
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00406	-0.00300	0.00371
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00630	-0.00485	0.00422
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00966	-0.00708	0.00648
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01303	-0.00894	0.00893
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00062	-0.00060	0.00055

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.09367	0.09352	0.00877	0.08756

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	6.62523	6.72955

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)	-	0.02192	0.23960	1.46429
	A1->Y (RR)	-	0.02410	0.24171	1.46727
	S0->Y (RR)	(!A0 * A1)	0.07638	0.35619	1.62402
	S0->Y (FR)	(A0 * !A1)	0.04064	0.29397	1.23486

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)	-	0.02256	0.24458	1.48132
	A1->Y (FF)	-	0.02016	0.24164	1.47006
	S0->Y (FF)	(!A0 * A1)	0.07932	0.30017	0.58961
	S0->Y (RF)	(A0 * !A1)	0.04218	0.37015	2.26324

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	-	-0.00489	-0.00490	-0.00490
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00330	-0.00331	-0.00331
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00584	0.00703	0.03291
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00349	-0.00315	0.02137

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	-	0.00490	0.00490	0.00492
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00360	0.00360	0.00361
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00099	0.00148	0.02644
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01321	0.01420	0.03959

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)	-0.00115	-0.00114	-0.00114

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)	0.00125	0.00125	0.00125

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)	-0.00142	-0.00142	-0.00142

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)	0.00142	0.00142	0.00142

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)	-0.00127	-0.00087	0.02389
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00123	-0.00088	0.02405

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)	0.01006	0.01115	0.03657
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00902	0.01022	0.03600

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00430	0.00428	0.84659
sky130_osu_sc_15T_ms__nand2_l	0.00313	0.00312	0.51645

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	3.17873	12.35400
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.25687	0.76410

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)	0.03406	0.62932	7.32962
	B->Y (FR)	0.03932	0.62880	7.25356
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.05199	0.81987	8.51977
	B->Y (FR)	0.06071	0.82768	8.51575

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)	0.06303	0.97378	11.16210
	B->Y (RF)	0.07127	0.94382	10.61550
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.08041	1.10714	11.13470
	B->Y (RF)	0.08872	1.08030	10.55400

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	0.00527	0.00567	0.01059
	B	0.00000	0.00000	0.00000
	B	0.00659	0.00691	0.01176
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00381	0.00394	0.00585
	B	0.00000	0.00000	0.00000
	B	0.00469	0.00475	0.00681

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	-0.00044	-0.00041	0.00235
	B	0.00000	0.00000	0.00000
	B	-0.00039	-0.00050	0.00190
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00043	-0.00049	0.00080
	B	0.00000	0.00000	0.00000
	B	-0.00040	-0.00052	0.00056

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)	-0.00355	-0.00356	-0.00358
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00240	-0.00241	-0.00242

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)	0.00358	0.00360	0.00359
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00242	0.00244	0.00243

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)	-0.00334	-0.00336	-0.00334
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00226	-0.00227	-0.00226

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)	0.00339	0.00339	0.00335
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00229	0.00229	0.00227

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00427	0.00456	0.79464
sky130_osu_sc_15T_ms__nor2_l	0.00303	0.00335	0.42067

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	2.77398	6.32962
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.27965	0.48524

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)	0.07304	0.86938	9.45302
	B->Y (FR)	0.05602	0.88392	9.95175
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.10434	1.09198	9.84063
	B->Y (FR)	0.08639	1.09181	10.25700

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)	0.05492	0.72141	8.17460
	B->Y (RF)	0.04096	0.70390	8.15220
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.06001	0.73838	7.47267
	B->Y (RF)	0.04822	0.72468	7.45160

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	0.00714	0.00715	0.01048
	B	0.00000	0.00000	0.00000
	B	0.00540	0.00570	0.01069
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00494	0.00490	0.00641
	B	0.00000	0.00000	0.00000
	B	0.00389	0.00379	0.00626

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	0.00097	0.00090	0.00404
	B	0.00000	0.00000	0.00000
	B	-0.00072	-0.00051	0.00253
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00055	0.00046	0.00208
	B	0.00000	0.00000	0.00000
	B	-0.00044	-0.00038	0.00116

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)	-0.00254	-0.00307	-0.00314
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00171	-0.00205	-0.00208

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)	0.00326	0.00328	0.00328
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00207	0.00209	0.00209

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)	-0.00147	-0.00149	-0.00148
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00095	-0.00096	-0.00095

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)	0.00160	0.00160	0.00153
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00100	0.00100	0.00097

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00430	0.00439	0.00356	0.77188

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	1.64332	6.81466

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)	0.07686	0.91000	9.93141
	A1->Y (FR)	0.09780	0.90073	9.44843
	B0->Y (FR)	0.06328	0.92946	10.37610

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)	0.08612	0.95261	10.27550
	A1->Y (RF)	0.11064	0.95327	10.01720
	B0->Y (RF)	0.06707	0.97912	10.92340

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	0.00734	0.00750	0.01183
	A1	0.00000	0.00000	0.00000
	A1	0.00910	0.00905	0.01206
	B0	0.00605	0.00615	0.00858

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	0.00032	0.00021	0.00250
	A1	0.00000	0.00000	0.00000
	A1	0.00197	0.00169	0.00405
	B0	0.00271	0.00267	0.00409

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)	-0.00148	-0.00149	-0.00148
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00321	-0.00324	-0.00323
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00326	-0.00328	-0.00326

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)	0.00160	0.00161	0.00154
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00321	0.00324	0.00323
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00329	0.00330	0.00327

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)	-0.00245	-0.00299	-0.00308
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00318	-0.00320	-0.00320
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00322	-0.00324	-0.00322

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)	0.00321	0.00322	0.00322
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00318	0.00322	0.00320
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00323	0.00326	0.00324

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)	-0.00244	-0.00245	-0.00250

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)	0.00251	0.00254	0.00252

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00418	0.00440	0.00452	0.00442	0.78765

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	4.04330	12.36100

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)	0.10622	0.90403	9.44222
	A1->Y (FR)	0.08867	0.91284	9.94130
	B0->Y (FR)	0.06338	0.89248	9.92346
	B1->Y (FR)	0.08207	0.88011	9.42783

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)	0.15571	1.04303	10.55030
	A1->Y (RF)	0.12271	1.00258	10.45410
	B0->Y (RF)	0.10563	1.02876	11.12120
	B1->Y (RF)	0.13969	1.07154	11.23320

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	0.01188	0.01183	0.01473
	A1	0.01008	0.01022	0.01452
	B0	0.00745	0.00772	0.01193
	B1	0.00931	0.00933	0.01222

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00341	0.00311	0.00535
	A1	0.00193	0.00171	0.00389
	B0	-0.00017	-0.00005	0.00273
	B1	0.00343	0.00323	0.00586

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)	-0.00253	-0.00307	-0.00314
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00250	-0.00304	-0.00311
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00319	-0.00323	-0.00320
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00323	-0.00324	-0.00323

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)	0.00327	0.00329	0.00328
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00330	0.00332	0.00331
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00319	0.00323	0.00320
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00326	0.00327	0.00324

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)	-0.00147	-0.00148	-0.00147
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00143	-0.00145	-0.00144
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00317	-0.00318	-0.00318
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00321	-0.00322	-0.00321

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)	0.00159	0.00159	0.00152
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00162	0.00162	0.00155
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00317	0.00318	0.00318
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00323	0.00324	0.00322

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)	-0.00145	-0.00147	-0.00146
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00144	-0.00145	-0.00143
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00349	-0.00351	-0.00351
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00340	-0.00342	-0.00352

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)	0.00157	0.00159	0.00151
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00160	0.00162	0.00154
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00351	0.00357	0.00351
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00354	0.00356	0.00354

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)	-0.00249	-0.00302	-0.00308
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00246	-0.00299	-0.00306
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00357	-0.00359	-0.00357
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00348	-0.00350	-0.00358

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)	0.00321	0.00322	0.00323
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00324	0.00327	0.00326
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00357	0.00362	0.00357
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00359	0.00362	0.00360

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00463	0.00440	1.55941
sky130_osu_sc_15T_ms__or2_2	0.00463	0.00440	3.05800
sky130_osu_sc_15T_ms__or2_4	0.00463	0.00440	5.92409
sky130_osu_sc_15T_ms__or2_8	0.00463	0.00441	11.56258
sky130_osu_sc_15T_ms__or2_l	0.00343	0.00319	0.78220

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	4.44093	6.43631
sky130_osu_sc_15T_ms__or2_2	0.00000	5.94141	12.45420
sky130_osu_sc_15T_ms__or2_4	0.00000	9.10466	24.80880
sky130_osu_sc_15T_ms__or2_8	0.00000	15.43110	49.51770
sky130_osu_sc_15T_ms__or2_l	0.00000	0.46080	0.56010

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)	0.10833	0.77775	7.68942
	B->Y (RR)	0.09025	0.72679	7.51167
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.11961	0.72076	7.74807
	B->Y (RR)	0.10134	0.67817	7.58689
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.15410	0.73526	8.05945
	B->Y (RR)	0.13568	0.70144	7.91611
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.22046	0.81453	8.60951
	B->Y (RR)	0.20170	0.78914	8.48794
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.13502	0.97710	8.04293
	B->Y (RR)	0.11632	0.92872	7.85958

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)	0.16134	0.82664	7.80625
	B->Y (FF)	0.13859	0.80681	7.81961
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.18892	0.78117	7.92239
	B->Y (FF)	0.16633	0.77645	7.94999
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.26532	0.83309	8.31911
	B->Y (FF)	0.24274	0.84355	8.38002
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.42240	0.99566	8.87936
	B->Y (FF)	0.39994	1.00853	8.97257
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.21962	0.92608	6.43997
	B->Y (FF)	0.18983	0.90447	6.41877

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	0.00571	0.00570	0.02109
	B	0.00000	0.00000	0.00000
	B	0.00412	0.00453	0.02214
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00956	0.00980	0.02552
	B	0.00000	0.00000	0.00000
	B	0.00793	0.00856	0.02631
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01820	0.01888	0.03440
	B	0.00000	0.00000	0.00000
	B	0.01654	0.01773	0.03539
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03690	0.03732	0.05172
	B	0.00000	0.00000	0.00000
	B	0.03508	0.03576	0.05257
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00396	0.00377	0.01128
	B	0.00000	0.00000	0.00000
	B	0.00293	0.00295	0.01129

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	0.01161	0.01181	0.02753
	B	0.00000	0.00000	0.00000
	B	0.00956	0.01082	0.03277
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01425	0.01484	0.03021
	B	0.00000	0.00000	0.00000
	B	0.01225	0.01377	0.03497
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02155	0.02210	0.03700
	B	0.00000	0.00000	0.00000
	B	0.01951	0.02098	0.04117
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03993	0.03686	0.05103
	B	0.00000	0.00000	0.00000
	B	0.03790	0.03514	0.05492
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00830	0.00814	0.01586
	B	0.00000	0.00000	0.00000
	B	0.00691	0.00732	0.01744

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)	-0.00252	-0.00310	-0.00316
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00252	-0.00310	-0.00316
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00252	-0.00310	-0.00316
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00251	-0.00310	-0.00316
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00172	-0.00205	-0.00210

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)	0.00328	0.00332	0.00330
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00328	0.00332	0.00330
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00328	0.00332	0.00330
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00328	0.00332	0.00330
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00209	0.00212	0.00211

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)	-0.00148	-0.00149	-0.00149
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00148	-0.00150	-0.00149
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00148	-0.00149	-0.00149
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00148	-0.00149	-0.00148
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00096	-0.00098	-0.00097

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)	0.00161	0.00161	0.00154
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00161	0.00154
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00154
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00154
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00102	0.00103	0.00099

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00454	0.00575	0.80257
sky130_osu_sc_15T_ms__tbufi_l	0.00335	0.00427	0.42042

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	3.33886	12.66030
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.36782	0.97049

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)	0.05334	0.88129	9.96406
	OE->Y (FR)	0.05550	0.37348	4.68852
	OE->Y (RR)	0.11167	0.86864	7.76222
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.08288	1.08992	10.25040
	OE->Y (FR)	0.07452	0.37334	4.68830
	OE->Y (RR)	0.14719	1.08954	7.84523

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)	0.06215	0.95429	10.79910
	OE->Y (FF)	0.05642	0.37349	4.68851
	OE->Y (RF)	0.05699	0.91178	10.22140
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.08029	1.02474	9.83929
	OE->Y (FF)	0.07559	0.37332	4.68829
	OE->Y (RF)	0.07109	0.97733	9.21405

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	0.00526	0.00555	0.00983
	OE	0.00000	0.00000	0.00000
	OE	0.00520	0.00566	0.02827
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00369	0.00361	0.00578
	OE	0.00000	0.00000	0.00000
	OE	0.00352	0.00352	0.01455

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	-0.00051	-0.00035	0.00226
	OE	0.00000	0.00000	0.00000
	OE	0.00353	0.00402	0.02902
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00042	-0.00041	0.00094
	OE	0.00000	0.00000	0.00000
	OE	0.00219	0.00217	0.01412

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)	-0.00245	-0.00250	-0.00246
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00213	-0.00214	-0.00212
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00172	-0.00175	-0.00172
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00150	-0.00151	-0.00150

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)	0.00245	0.00250	0.00246
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00219	0.00221	0.00216
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00172	0.00175	0.00172
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00153	0.00154	0.00151

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)	0.00210	0.00271	0.02786
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00174	0.00234	0.02748
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00131	0.00134	0.01329
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00111	0.00115	0.01307

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)	0.00608	0.00701	0.03273
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00593	0.00697	0.03272
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00449	0.00468	0.01675
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00449	0.00472	0.01682

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00454	0.00712	0.80414
sky130_osu_sc_15T_ms__tnbufi_l	0.00334	0.00499	0.42498

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	5.41369	6.48338
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.50462	0.59962

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)	0.05386	0.88206	9.97636
	OE->Y (RR)	0.04649	0.37428	4.68931
	OE->Y (FR)	0.06744	0.86346	9.44998
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.08387	1.09512	10.32250
	OE->Y (RR)	0.05184	0.37420	4.68921
	OE->Y (FR)	0.09687	1.09014	9.88046

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)	0.06116	0.95463	10.81180
	OE->Y (RF)	0.04604	0.37429	4.68932
	OE->Y (FF)	0.08672	0.75292	6.69607
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.07888	1.02851	9.90031
	OE->Y (RF)	0.05146	0.37422	4.68920
	OE->Y (FF)	0.11614	0.88286	6.04540

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	0.00522	0.00551	0.00981
	OE	0.00000	0.00000	0.00000
	OE	0.01262	0.01408	0.04053
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00381	0.00372	0.00589
	OE	0.00000	0.00000	0.00000
	OE	0.00888	0.00940	0.02188

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	-0.00086	-0.00068	0.00192
	OE	0.00000	0.00000	0.00000
	OE	0.01110	0.01259	0.03737
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00061	-0.00058	0.00075
	OE	0.00000	0.00000	0.00000
	OE	0.00766	0.00820	0.02029

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)	-0.00216	-0.00219	-0.00216
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00174	-0.00176	-0.00175
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00139	-0.00142	-0.00140
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00119	-0.00119	-0.00119

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)	0.00216	0.00219	0.00216
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00192	0.00193	0.00189
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00139	0.00142	0.00140
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00122	0.00122	0.00121

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)	-0.00360	-0.00333	0.02233
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00381	-0.00346	0.02229
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00228	-0.00251	0.00969
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00234	-0.00250	0.00970

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)	0.00961	0.01113	0.03753
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00934	0.01093	0.03728
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00665	0.00721	0.01972
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00653	0.00705	0.01957

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00902	0.00811	0.81357

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__xnor2_l	0.00000	11.50520	18.81270

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_1	A->Y (RR)	B	0.13954	0.91437	7.90479
	A->Y (FR)	!B	0.07045	0.90193	10.01790
	B->Y (RR)	A	0.11417	0.89027	7.94722
	B->Y (FR)	!A	0.09206	0.88940	9.52816

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (FF)	B	0.16325	0.88625	7.06671
	A->Y (RF)	!B	0.08428	0.93943	10.35440
	B->Y (FF)	A	0.13027	0.85591	7.04773
	B->Y (RF)	!A	0.11101	0.97078	10.37820

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	0.00541	0.00566	0.02814
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01257	0.01378	0.04386
	B	A	0.00000	0.00000	0.00000
	B	A	0.00195	0.00254	0.02779
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01376	0.01491	0.04354

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	0.01570	0.01628	0.04179
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00363	0.00393	0.03088
	B	A	0.00000	0.00000	0.00000
	B	A	0.01409	0.01544	0.04158
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00474	0.00493	0.03194

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.00904	0.00816	0.80477

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	11.50520	20.19250

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	0.13556	0.91027	7.97583
	A->Y (FR)	B	0.08753	0.88609	9.56259
	B->Y (RR)	!A	0.11853	0.89893	7.97883
	B->Y (FR)	A	0.09531	0.89533	9.56103

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	0.13622	0.85684	6.92881
	A->Y (RF)	B	0.09828	0.99823	10.85300
	B->Y (FF)	!A	0.12839	0.85427	6.99418
	B->Y (RF)	A	0.10888	0.96851	10.31460

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	0.01477	0.01593	0.04455
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00271	0.00255	0.02713
	B	A	0.00000	0.00000	0.00000
	B	A	0.01523	0.01643	0.04482
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00165	0.00215	0.02728

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	0.00347	0.00373	0.03113
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01567	0.01690	0.04109
	B	A	0.00000	0.00000	0.00000
	B	A	0.00353	0.00365	0.03045
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01416	0.01556	0.04161

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ss_1P60_150C.ccs
Cell Library: Process , Voltage 1.60, Temp 150.00

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	0.55409
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	177945.00000	355890.00000
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
	-0.00151	0.05688	0.71718

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
	3.09670	2.92409	0.85490