sky130_osu_sc_15T_ms_ff_1P95_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_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.01589	0.01577	0.01209	2.68261	1.31128	2.64880
sky130_osu_sc_15T_ms__addf_l	0.01589	0.01575	0.01208	1.82462	1.31169	1.88747

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	1448.88000	1786.63000
sky130_osu_sc_15T_ms__addf_l	0.00000	1272.37000	1610.23000

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)	0.11304	1.42034	24.79830
	B->CO (RR)	0.11429	1.40058	24.17870
	CI->CO (RR)	0.10665	1.45826	25.41970
	CON->CO (FR)	0.01725	0.54653	9.29374
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.11250	1.29988	19.61410
	B->CO (RR)	0.11383	1.29198	19.38060
	CI->CO (RR)	0.10608	1.33915	20.26480
	CON->CO (FR)	0.01936	0.58651	9.10385

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)	0.12552	1.56928	27.53670
	B->CO (FF)	0.11130	1.52975	26.81610
	CI->CO (FF)	0.10965	1.60267	28.21580
	CON->CO (RF)	0.02023	0.58266	10.06670
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.11905	1.36169	20.57420
	B->CO (FF)	0.10538	1.33859	20.32050
	CI->CO (FF)	0.10317	1.39605	21.27430
	CON->CO (RF)	0.02027	0.56814	8.81406

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)	0.09146	0.63188	8.07677
	B->CON (FR)	0.07816	0.63456	8.29213
	CI->CON (FR)	0.07560	0.66763	8.79662
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.08692	0.62755	8.07343
	B->CON (FR)	0.07401	0.63045	8.28986
	CI->CON (FR)	0.07105	0.66333	8.79398

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)	0.08503	0.59729	7.62850
	B->CON (RF)	0.08654	0.61467	7.88299
	CI->CON (RF)	0.07865	0.63780	8.32410
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.08111	0.59281	7.62630
	B->CON (RF)	0.08280	0.61130	7.88101
	CI->CON (RF)	0.07473	0.63410	8.32196

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)	0.18688	1.42278	22.66810
	B->S (-R)	0.20170	1.40944	21.64850
	CI->S (-R)	0.16961	1.45480	23.34830
	CON->S (RR)	0.06007	0.50185	7.32136
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.17674	1.30462	18.41580
	B->S (-R)	0.16897	1.27871	17.87960
	CI->S (-R)	0.15946	1.33575	19.11200
	CON->S (RR)	0.05761	0.52609	7.06478

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)	0.18075	1.39711	21.86590
	B->S (-F)	0.17240	1.34578	21.20190
	CI->S (-F)	0.17614	1.43651	22.49380
	CON->S (FF)	0.06926	0.56197	8.02730
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.16769	1.26057	17.48550
	B->S (-F)	0.16609	1.22554	17.11350
	CI->S (-F)	0.16294	1.30121	18.14270
	CON->S (FF)	0.06379	0.55481	7.21720

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	0.02618	0.03665	0.24666
	B	0.02966	0.03925	0.23258
	CI	0.02887	0.03957	0.24843
sky130_osu_sc_15T_ms__addf_l	A	0.02032	0.02867	0.17447
	B	0.02366	0.03130	0.16593
	CI	0.02298	0.03164	0.17669

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.04368	0.05737	0.32968
	B	0.03957	0.05127	0.29551
	CI	0.04136	0.05556	0.32828
sky130_osu_sc_15T_ms__addf_l	A	0.03489	0.04561	0.23145
	B	0.03190	0.04099	0.20831
	CI	0.03258	0.04366	0.22963

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.03325	0.04276	0.19758
	B	0.03066	0.03922	0.18112
	CI	0.03121	0.04116	0.19653
sky130_osu_sc_15T_ms__addf_l	A	0.03035	0.03940	0.18610
	B	0.02782	0.03596	0.17096
	CI	0.02826	0.03776	0.18519

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01748	0.02503	0.15068
	B	0.01792	0.02489	0.14756
	CI	0.02041	0.02820	0.15510
sky130_osu_sc_15T_ms__addf_l	A	0.01474	0.02189	0.14055
	B	0.01530	0.02186	0.13729
	CI	0.01762	0.02504	0.14435

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02940	0.03759	0.29393
	B	0.03342	0.04079	0.27226
	CI	0.03479	0.04459	0.27498
sky130_osu_sc_15T_ms__addf_l	A	0.02738	0.03602	0.29392
	B	0.03139	0.03911	0.27159
	CI	0.03276	0.04301	0.27481

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.08296	0.09433	0.32490
	B	0.06996	0.08041	0.29073
	CI	0.06101	0.07222	0.28427
sky130_osu_sc_15T_ms__addf_l	A	0.07249	0.08449	0.32261
	B	0.06006	0.07128	0.28900
	CI	0.05188	0.06363	0.28298

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00771	0.00859	2.70726	1.42433	2.78984
sky130_osu_sc_15T_ms__addh_l	0.00771	0.00859	1.93801	1.42082	1.99930

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	1576.84000	1793.21000
sky130_osu_sc_15T_ms__addh_l	0.00000	1355.60000	1617.00000

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)	0.07349	0.52837	7.46959
	B->CO (RR)	0.07656	0.51720	7.51035
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.07205	0.55910	7.36084
	B->CO (RR)	0.07510	0.54644	7.31543

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)	0.05744	0.51510	7.70898
	B->CO (FF)	0.06213	0.53682	7.96010
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.05308	0.47037	6.18944
	B->CO (FF)	0.05745	0.49141	6.43558

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	0.09997	0.43699	4.35646
	A->CON (FR)	!B	0.04813	0.61899	8.63612
	B->CON (RR)	A	0.10180	0.42512	4.38761
	B->CON (FR)	!A	0.06111	0.59350	8.10167
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.09259	0.42690	4.38467
	A->CON (FR)	!B	0.04408	0.61430	8.62265
	B->CON (RR)	A	0.09449	0.41452	4.36635
	B->CON (FR)	!A	0.05706	0.58846	8.08264

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	0.09953	0.55105	6.05908
	A->CON (RF)	!B	0.04996	0.61655	8.58985
	B->CON (FF)	A	0.09561	0.58330	6.57296
	B->CON (RF)	!A	0.06102	0.60677	8.28121
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.09256	0.53742	5.99911
	A->CON (RF)	!B	0.04625	0.61211	8.57069
	B->CON (FF)	A	0.08861	0.56937	6.51044
	B->CON (RF)	!A	0.05739	0.60265	8.26391

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	0.07544	1.42849	25.92240
	A->S (FR)	B	0.12640	1.36080	23.34640
	B->S (RR)	!A	0.08781	1.39879	25.05350
	B->S (FR)	A	0.12164	1.41469	24.41810
	CON->S (FR)	-	0.01893	0.57168	9.78994
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.07256	1.31504	21.14260
	A->S (FR)	B	0.12058	1.23658	18.51300
	B->S (RR)	!A	0.08531	1.29101	20.49670
	B->S (FR)	A	0.11544	1.28403	19.35760
	CON->S (FR)	-	0.01970	0.59964	9.50378

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	0.07728	1.48540	27.07190
	A->S (RF)	B	0.12670	1.12526	18.53280
	B->S (FF)	!A	0.09029	1.46461	26.58570
	B->S (RF)	A	0.12852	1.11300	18.55910
	CON->S (RF)	-	0.01937	0.58080	10.12150
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.07174	1.33222	21.51070
	A->S (RF)	B	0.11805	1.02903	14.92530
	B->S (FF)	!A	0.08476	1.31003	21.00460
	B->S (RF)	A	0.11993	1.01580	14.88760
	CON->S (RF)	-	0.01932	0.57830	9.25132

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	0.02408	0.02963	0.12900
	B	0.00000	0.00000	0.00000
	B	0.02320	0.02912	0.14790
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.02136	0.02682	0.12506
	B	0.00000	0.00000	0.00000
	B	0.02043	0.02618	0.13893

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	0.02519	0.03330	0.18637
	B	0.00000	0.00000	0.00000
	B	0.02811	0.03770	0.20490
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.02051	0.02784	0.15910
	B	0.00000	0.00000	0.00000
	B	0.02300	0.03154	0.17250

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	0.01803	0.02345	0.11826
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02689	0.03317	0.12347
	B	A	0.00000	0.00000	0.00000
	B	A	0.01718	0.02301	0.13608
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02794	0.03345	0.12135
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01592	0.02141	0.11804
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02103	0.02679	0.10809
	B	A	0.00000	0.00000	0.00000
	B	A	0.01505	0.02082	0.13196
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02221	0.02714	0.10573

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	0.02289	0.03021	0.15876
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02484	0.03091	0.11600
	B	A	0.00000	0.00000	0.00000
	B	A	0.02600	0.03457	0.17262
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02178	0.02731	0.11193
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02048	0.02755	0.15104
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02159	0.02678	0.09890
	B	A	0.00000	0.00000	0.00000
	B	A	0.02351	0.03173	0.16341
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01863	0.02334	0.09581

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	0.03208	0.04022	0.19555
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.03993	0.04695	0.15840
	B	A	0.00000	0.00000	0.00000
	B	A	0.03675	0.04638	0.21593
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.03463	0.04079	0.14497
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02656	0.03392	0.16668
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.03146	0.03702	0.11432
	B	A	0.00000	0.00000	0.00000
	B	A	0.03060	0.03920	0.18204
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02704	0.03201	0.10691

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	0.02936	0.03484	0.13541
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.03667	0.04361	0.15834
	B	A	0.00000	0.00000	0.00000
	B	A	0.02845	0.03436	0.15362
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.03800	0.04439	0.15720
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02353	0.02899	0.12718
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02502	0.03085	0.11613
	B	A	0.00000	0.00000	0.00000
	B	A	0.02257	0.02832	0.14188
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02637	0.03146	0.11483

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00416	0.00430	2.71010
sky130_osu_sc_15T_ms__and2_2	0.00416	0.00431	5.19067
sky130_osu_sc_15T_ms__and2_4	0.00416	0.00431	9.98713
sky130_osu_sc_15T_ms__and2_6	0.00419	0.00431	14.69195
sky130_osu_sc_15T_ms__and2_8	0.00417	0.00432	18.81214
sky130_osu_sc_15T_ms__and2_l	0.00317	0.00331	1.79084

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	748.18200	1195.02000
sky130_osu_sc_15T_ms__and2_2	0.00000	1196.91000	1197.80000
sky130_osu_sc_15T_ms__and2_4	0.00000	2093.87000	2393.58000
sky130_osu_sc_15T_ms__and2_6	0.00000	2990.76000	3589.32000
sky130_osu_sc_15T_ms__and2_8	0.00000	3887.07000	4784.53000
sky130_osu_sc_15T_ms__and2_l	0.00000	526.99900	841.85400

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)	0.05581	0.49168	7.55646
	B->Y (RR)	0.05981	0.46805	7.09579
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.06535	0.44479	7.48046
	B->Y (RR)	0.06947	0.41870	6.99194
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.09249	0.44972	7.62665
	B->Y (RR)	0.09667	0.42148	7.12393
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.12094	0.47695	7.72798
	B->Y (RR)	0.12504	0.44555	7.22164
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.14855	0.50640	7.75324
	B->Y (RR)	0.15275	0.47357	7.22770
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.05488	0.51463	7.08022
	B->Y (RR)	0.05882	0.48853	6.55307

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)	0.04614	0.46847	7.32112
	B->Y (FF)	0.04815	0.48216	7.46495
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.05093	0.40504	7.11325
	B->Y (FF)	0.05347	0.41913	7.29263
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.07003	0.39612	7.11767
	B->Y (FF)	0.07238	0.40829	7.30901
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.09127	0.41722	7.15314
	B->Y (FF)	0.09324	0.42677	7.34300
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.11150	0.43811	7.00236
	B->Y (FF)	0.11339	0.44674	7.19019
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.04722	0.47659	6.43556
	B->Y (FF)	0.04970	0.49182	6.59681

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	0.03723	0.05534	0.35463
	B	0.00000	0.00000	0.00000
	B	0.03689	0.05119	0.29822
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.04364	0.06113	0.36628
	B	0.00000	0.00000	0.00000
	B	0.04331	0.05700	0.30440
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.06136	0.07737	0.38646
	B	0.00000	0.00000	0.00000
	B	0.06106	0.07231	0.32067
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.08689	0.09604	0.41582
	B	0.00000	0.00000	0.00000
	B	0.08655	0.09051	0.33695
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.11708	0.11747	0.45217
	B	0.00000	0.00000	0.00000
	B	0.11674	0.11049	0.35421
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.02589	0.04176	0.29750
	B	0.00000	0.00000	0.00000
	B	0.02564	0.03768	0.24086

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	0.02902	0.04792	0.33124
	B	0.00000	0.00000	0.00000
	B	0.03074	0.04932	0.32688
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.04921	0.06681	0.34553
	B	0.00000	0.00000	0.00000
	B	0.05097	0.06833	0.34049
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.09609	0.10806	0.37449
	B	0.00000	0.00000	0.00000
	B	0.09781	0.10938	0.36749
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.14653	0.15104	0.40447
	B	0.00000	0.00000	0.00000
	B	0.14819	0.15194	0.39633
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.20049	0.19311	0.43361
	B	0.00000	0.00000	0.00000
	B	0.20211	0.19486	0.42289
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.02002	0.03595	0.27206
	B	0.00000	0.00000	0.00000
	B	0.02122	0.03665	0.26567

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)	0.00023	0.00022	0.00019
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00543	0.00542	0.00539
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01581	0.01580	0.01577
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.02616	0.02616	0.02612
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.03658	0.03658	0.03653
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00018	0.00017	0.00014

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)	0.01023	0.01033	0.01025
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01545	0.01555	0.01547
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.02587	0.02598	0.02589
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.03633	0.03643	0.03636
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.04671	0.04682	0.04674
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00718	0.00726	0.00720

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)	0.00050	0.00047	0.00049
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00569	0.00569	0.00568
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01607	0.01602	0.01607
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.02645	0.02642	0.02645
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.03681	0.03680	0.03682
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00037	0.00035	0.00036

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)	0.01014	0.00998	0.00996
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01536	0.01519	0.01518
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.02579	0.02562	0.02560
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.03621	0.03604	0.03602
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.04662	0.04646	0.04644
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00716	0.00709	0.00702

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00398	0.00411	0.00398	1.23506

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	309.72700	615.86800

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)	0.04954	0.59094	7.90766
	A1->Y (FR)	0.04121	0.55913	7.55385
	B0->Y (FR)	0.03507	0.63552	8.73181

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)	0.04628	0.52660	6.97439
	A1->Y (RF)	0.04240	0.55998	7.53834
	B0->Y (RF)	0.02448	0.49273	6.81687

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	0.01221	0.01777	0.11553
	A1	0.00000	0.00000	0.00000
	A1	0.01016	0.01561	0.10944
	B0	0.00695	0.01647	0.14627

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	0.01606	0.01976	0.08790
	A1	0.00000	0.00000	0.00000
	A1	0.01664	0.02108	0.09147
	B0	0.01125	0.01769	0.10335

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)	-0.00217	-0.00292	0.00021
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00083	0.00077	0.00081
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00435	-0.00438	-0.00435

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)	0.00962	0.00951	0.00873
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00955	0.00956	0.00956
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00461	0.00446	0.00443

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)	-0.00209	-0.00286	0.00028
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00089	0.00085	0.00087
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00464	-0.00467	-0.00469

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)	0.00956	0.00947	0.00867
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00948	0.00950	0.00948
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00473	0.00475	0.00475

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)	-0.00135	-0.00134	-0.00058

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)	0.00812	0.00793	0.00517

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__aoi22_1	0.00398	0.00409	0.00421	0.00403	1.26230

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_1	0.00000	344.27200	1183.40000

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)	0.05990	0.59579	7.88540
	A1->Y (FR)	0.05341	0.58302	7.76984
	B0->Y (FR)	0.03531	0.61610	8.50290
	B1->Y (FR)	0.04180	0.63406	8.68103

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)	0.06124	0.54781	7.12045
	A1->Y (RF)	0.05724	0.58007	7.67833
	B0->Y (RF)	0.02905	0.55040	7.64588
	B1->Y (RF)	0.03302	0.51681	7.08390

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	0.01513	0.02076	0.12287
	A1	0.01309	0.01856	0.11627
	B0	0.00754	0.01572	0.12760
	B1	0.00953	0.01766	0.13179

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.01997	0.02366	0.09544
	A1	0.02054	0.02508	0.09824
	B0	0.02627	0.03105	0.09617
	B1	0.02536	0.02934	0.09228

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)	-0.00160	-0.00225	0.00421
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00593	0.00585	0.00591
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00436	-0.00439	-0.00437
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00436	-0.00439	-0.00436

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)	0.01475	0.01448	0.01260
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.01466	0.01470	0.01464
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00460	0.00445	0.00442
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00460	0.00445	0.00442

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)	-0.00153	-0.00219	0.00429
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00596	0.00592	0.00596
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00464	-0.00467	-0.00470
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00464	-0.00467	-0.00470

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)	0.01470	0.01449	0.01255
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.01460	0.01464	0.01456
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00471	0.00472	0.00473
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00471	0.00472	0.00473

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)	-0.00128	-0.00127	-0.00074
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00385	0.00381	0.00385
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00480	-0.00485	-0.00486
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00480	-0.00485	-0.00486

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)	0.00834	0.00817	0.00549
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00721	0.00720	0.00691
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00488	0.00490	0.00489
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00488	0.00490	0.00489

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)	-0.00130	-0.00129	-0.00076
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00383	0.00382	0.00384
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00444	-0.00447	-0.00445
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00444	-0.00448	-0.00445

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)	0.00835	0.00818	0.00551
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00723	0.00722	0.00693
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00468	0.00452	0.00450
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00468	0.00452	0.00450

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00429	2.67425
sky130_osu_sc_15T_ms__buf_2	0.00433	5.16282
sky130_osu_sc_15T_ms__buf_4	0.00433	9.92281
sky130_osu_sc_15T_ms__buf_6	0.00090	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00434	19.13587
sky130_osu_sc_15T_ms__buf_l	0.00332	1.82412

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	599.47300	599.76500
sky130_osu_sc_15T_ms__buf_2	0.00000	899.04100	1197.90000
sky130_osu_sc_15T_ms__buf_4	0.00000	1497.99000	2393.66000
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	2695.54000	4784.54000
sky130_osu_sc_15T_ms__buf_l	0.00000	422.91800	423.09100

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)	0.04333	0.43733	6.83790
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.04999	0.38677	6.74544
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.06873	0.38421	6.82116
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.10811	0.42903	7.00905
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.04405	0.46223	6.42420

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)	0.04343	0.47315	7.50582
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.04957	0.42308	7.58216
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.06903	0.41417	7.67423
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.11095	0.45622	7.76304
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.04484	0.48997	6.83880

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	0.02053	0.03795	0.30112
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.02601	0.04310	0.30037
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.04040	0.05748	0.31940
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.08324	0.09540	0.36204
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01454	0.02951	0.25578

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	0.02819	0.04818	0.34600
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.04991	0.06772	0.33568
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.09838	0.11077	0.36576
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.20861	0.20147	0.42454
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01967	0.03656	0.28672

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
	-0.00089	-0.00089	-0.00085

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
	0.00089	0.00089	0.00085

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00410	0.00402	0.01162	2.43784	2.41291
sky130_osu_sc_15T_ms__dffr_l	0.00410	0.00402	0.01162	1.83884	1.82135

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	2010.80000	3089.33000
sky130_osu_sc_15T_ms__dffr_l	0.00000	1834.48000	2913.26000

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)	0.19192	1.12112	16.04510
	QN->Q (FR)	0.02186	0.65948	10.98210
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.18215	1.16338	15.30970
	QN->Q (FR)	0.02179	0.66775	10.38940

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)	0.20353	1.12417	16.22240
	QN->Q (RF)	0.02247	0.63446	10.58470
	RN->Q (FF)	0.15028	1.07885	16.10730
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.19931	1.18646	15.71200
	QN->Q (RF)	0.02152	0.62436	9.71145
	RN->Q (FF)	0.14627	1.14140	15.59190

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)	0.17865	0.59203	6.62546
	RN->QN (FR)	0.12533	0.54737	6.51019
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.17500	0.62668	6.65012
	RN->QN (FR)	0.12187	0.58146	6.52906

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)**	0.16807	0.61715	6.95103
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.15720	0.62147	6.55868

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)	-0.05322	-0.04746	-0.02638
	setup	CK (R)	0.14962	0.18049	0.40009
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05322	-0.04746	-0.02357
	setup	CK (R)	0.15153	0.18444	0.42868

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)	-0.07013	-0.18299	-0.75546
	setup	CK (R)	0.09403	0.19495	2.88782
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07350	-0.18278	-0.58159
	setup	CK (R)	0.09403	0.19495	2.88791

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)	-0.05322	-0.04746	-0.02638
	setup	CK (R)	0.14962	0.18049	0.40009
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.05322	-0.04746	-0.02357
	setup	CK (R)	0.15153	0.18444	0.42868

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)	-0.07013	-0.18299	-0.75546
	setup	CK (R)	0.09403	0.19495	2.88782
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07350	-0.18278	-0.58159
	setup	CK (R)	0.09403	0.19495	2.88791

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)	0.12390	0.17135	0.94688
	removal	CK (R)	-0.02683	-0.03315	-0.13976
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12612	0.17372	0.95585
	removal	CK (R)	-0.02683	-0.03315	-0.14269

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)	0.12390	0.17135	0.94688
	removal	CK (R)	-0.02683	-0.03315	-0.13976
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12612	0.17372	0.95585
	removal	CK (R)	-0.02683	-0.03315	-0.14269

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 ()	0.08303	0.47852	13.33370
	min_pulse_width	RN ()	0.08303	0.47852	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.07943	0.47852	13.33370
	min_pulse_width	RN ()	0.07943	0.47852	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 ()	0.09741	0.47852	13.33370
	min_pulse_width	CK ()	0.10460	0.47852	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.09022	0.47852	13.33370
	min_pulse_width	CK ()	0.10100	0.47852	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 ()	0.19089	0.47852	13.33370
	min_pulse_width	CK ()	0.07584	0.47852	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.19089	0.47852	13.33370
	min_pulse_width	CK ()	0.07584	0.47852	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	0.05715	0.07126	0.27228
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.05125	0.06658	0.29149

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	0.05784	0.06378	0.17658
	RN	-0.00155	-0.12447	-2.31688
	RN	0.06285	0.07002	0.19427
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.05150	0.05965	0.21570
	RN	-0.00155	-0.10510	-1.74770
	RN	0.05690	0.06633	0.23307

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	0.04829	0.05425	0.16729
	RN	-0.00155	-0.12371	-2.29190
	RN	0.05522	0.06245	0.18651
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.04450	0.05263	0.20815
	RN	-0.00155	-0.10450	-1.73083
	RN	0.05141	0.06077	0.22697

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	0.04559	0.05971	0.26122
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.03990	0.05520	0.27901

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	0.01907	0.01845	0.02191
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03468	0.04928	0.33952
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.02422	0.03713	0.29584
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01754	0.01692	0.02038
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03315	0.04775	0.33798
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.02268	0.03559	0.29430

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	0.03130	0.03123	0.03039
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.04776	0.06330	0.34863
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01937	0.03430	0.30378
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.02977	0.02969	0.02886
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.04623	0.06177	0.34709
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01783	0.03276	0.30224

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)	0.02662	0.04642	0.38870
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03221	0.05402	0.43313
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)	0.02508	0.04489	0.38716
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.03068	0.05249	0.43159

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)	0.02358	0.04528	0.39707
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.04368	0.06562	0.44171
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)	0.02204	0.04374	0.39553
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.04214	0.06408	0.44017

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)	0.02130	0.04087	0.38507
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02015	0.04112	0.42803
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02011	0.03956	0.38453
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01976	0.03934	0.38353
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01862	0.03958	0.42649
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01857	0.03802	0.38299

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)	0.03507	0.05689	0.40633
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05879	0.08020	0.54611
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.04842	0.06919	0.44601
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.06027	0.09937	0.64998
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.03754	0.05873	0.40823
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.03353	0.05536	0.40479
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05725	0.07866	0.54457
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.04688	0.06765	0.44447
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.05874	0.09783	0.64843
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.03600	0.05719	0.40669

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00405	0.00402	0.00893	0.01190	2.64116	2.62770
sky130_osu_sc_15T_ms__dffsr_l	0.00405	0.00402	0.00891	0.01190	1.84211	1.82460

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	2249.68000	3086.66000
sky130_osu_sc_15T_ms__dffsr_l	0.00000	2073.02000	2909.99000

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)	0.20201	1.13313	16.65950
	QN->Q (FR)	0.01906	0.59888	10.12680
	RN->Q (RR)	0.16604	1.11177	16.85070
	SN->Q (FR)	0.14195	1.08076	16.50270
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.19689	1.17367	15.28600
	QN->Q (FR)	0.02179	0.66676	10.37700
	RN->Q (RR)	0.16151	1.15277	15.46660
	SN->Q (FR)	0.13670	1.11540	15.11840

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)	0.24427	1.17639	16.83690
	QN->Q (RF)	0.02213	0.65476	11.23260
	RN->Q (FF)	0.15028	1.08979	16.75580
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.24287	1.23687	15.79430
	QN->Q (RF)	0.02148	0.62407	9.71368
	RN->Q (FF)	0.14913	1.15189	15.70470

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)	0.21873	0.62521	6.58179
	RN->QN (FR)	0.12543	0.53893	6.50068
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.21800	0.67662	6.71505
	RN->QN (FR)	0.12484	0.59177	6.62536

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)	0.18007	0.64254	7.50888
	RN->QN (RF)	0.14423	0.62130	7.69713
	SN->QN (FF)	0.11951	0.58870	7.36019
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.17223	0.63200	6.52953
	RN->QN (RF)	0.13704	0.61128	6.71607
	SN->QN (FF)	0.11232	0.57499	6.36701

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)	-0.05707	-0.05761	-0.02264
	setup	CK (R)	0.15804	0.18906	0.83854
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05775	-0.05761	-0.02195
	setup	CK (R)	0.15838	0.19138	0.61172

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)	-0.08818	-0.19864	-0.36886
	setup	CK (R)	0.11723	0.21484	2.98487
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08833	-0.19892	-0.20001
	setup	CK (R)	0.11725	0.21484	2.98568

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)	-0.05707	-0.05761	-0.02264
	setup	CK (R)	0.15804	0.18906	0.83854
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.05775	-0.05761	-0.02195
	setup	CK (R)	0.15838	0.19138	0.61172

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)	-0.08818	-0.19864	-0.36886
	setup	CK (R)	0.11723	0.21484	2.98487
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.08833	-0.19892	-0.20001
	setup	CK (R)	0.11725	0.21484	2.98568

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)	0.11442	0.16087	1.11510
	removal	CK (R)	-0.01666	-0.02205	-0.08849
	hold	SN (R)	-0.11243	-0.21882	-0.83210
	setup	SN (R)	0.13735	0.27137	4.16133
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.11535	0.16192	1.11081
	removal	CK (R)	-0.01666	-0.02205	-0.08849
	hold	SN (R)	-0.10792	-0.21086	-0.81418
	setup	SN (R)	0.13901	0.26449	4.15195

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)	0.11442	0.16087	1.11510
	removal	CK (R)	-0.01666	-0.02205	-0.08849
	hold	SN (R)	-0.11273	-0.21882	-0.84191
	hold	SN (R)	-0.11243	-0.22280	-0.83210
	setup	SN (R)	0.13735	0.27032	3.91526
	setup	SN (R)	0.13711	0.27137	4.16133
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.11535	0.16192	1.11081
	removal	CK (R)	-0.01666	-0.02205	-0.08849
	hold	SN (R)	-0.10792	-0.21086	-0.83461
	hold	SN (R)	-0.11032	-0.21086	-0.81418
	setup	SN (R)	0.13901	0.25863	3.91352
	setup	SN (R)	0.13275	0.26449	4.15195

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 ()	0.09741	0.47852	13.33370
	min_pulse_width	RN ()	0.09741	0.47852	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.09741	0.47852	13.33370
	min_pulse_width	RN ()	0.09381	0.47852	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)	0.04141	0.06999	2.87524
	removal	CK (R)	-0.02022	-0.04774	-0.26818
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04194	0.07007	2.81704
	removal	CK (R)	-0.02022	-0.04774	-0.26818

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)	0.04141	0.06999	2.87524
	removal	CK (R)	-0.02022	-0.04774	-0.26818
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04194	0.07007	2.81704
	removal	CK (R)	-0.02022	-0.04774	-0.26818

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 ()	0.11179	0.47852	13.33370
	min_pulse_width	SN ()	0.11179	0.47852	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.11179	0.47852	13.33370
	min_pulse_width	SN ()	0.10819	0.47852	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 ()	0.10100	0.47852	13.33370
	min_pulse_width	CK ()	0.12258	0.47852	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.09741	0.47852	13.33370
	min_pulse_width	CK ()	0.12258	0.47852	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 ()	0.19448	0.47852	13.33370
	min_pulse_width	CK ()	0.10100	0.47852	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.19448	0.47852	13.33370
	min_pulse_width	CK ()	0.10100	0.47852	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	0.06030	0.07368	0.27196
	RN	0.07448	0.08426	0.26078
	SN	-0.00155	-0.13060	-2.51012
	SN	0.05640	0.06645	0.23780
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.05472	0.06952	0.29471
	RN	0.06889	0.08016	0.28405
	SN	-0.00155	-0.10521	-1.75081
	SN	0.05122	0.06276	0.26053

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	0.07122	0.07886	0.22571
	RN	-0.00155	-0.13060	-2.51010
	RN	0.07752	0.08725	0.25962
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.06303	0.07082	0.22762
	RN	-0.00155	-0.10522	-1.75081
	RN	0.07015	0.08009	0.26205

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	0.05676	0.06438	0.21152
	RN	-0.00155	-0.13020	-2.49278
	RN	0.06610	0.07579	0.24853
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.05439	0.06219	0.21857
	RN	-0.00155	-0.10461	-1.73392
	RN	0.06344	0.07336	0.25489

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	0.05121	0.06461	0.26226
	RN	0.06541	0.07522	0.25123
	SN	-0.00155	-0.13020	-2.49710
	SN	0.05076	0.06084	0.23174
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.04339	0.05816	0.28225
	RN	0.05756	0.06879	0.27211
	SN	-0.00155	-0.10461	-1.73410
	SN	0.04450	0.05605	0.25288

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	0.02204	0.02203	0.02204
	(!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)	0.04109	0.05502	0.34746
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.02517	0.03803	0.29996
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.02699	0.03955	0.29720
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.03158	0.04427	0.30379
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02050	0.02049	0.02050
	(!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)	0.03956	0.05348	0.34592
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.02363	0.03650	0.29842
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.02545	0.03801	0.29567
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.03004	0.04273	0.30226

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	0.03093	0.03082	0.03074
	(!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)	0.05230	0.06701	0.35242
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.02738	0.04178	0.30763
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.02131	0.03581	0.30532
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.02923	0.04380	0.31143
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.02940	0.02928	0.02920
	(!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)	0.05076	0.06547	0.35087
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.02583	0.04023	0.30607
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01976	0.03429	0.30377
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.02768	0.04225	0.30988

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)	0.03167	0.05117	0.39154
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03775	0.05968	0.44491
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)	0.03013	0.04963	0.39001
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.03622	0.05815	0.44338

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)	0.02409	0.04601	0.39928
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.04624	0.06828	0.44960
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)	0.02253	0.04446	0.39772
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.04468	0.06672	0.44805

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)	0.01217	0.01209	0.01205
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00459	0.00314	0.00933
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01085	0.00998	0.01316
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.03058	0.04265	0.29384
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)	0.01063	0.01056	0.01052
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00307	0.00163	0.00781
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00932	0.00845	0.01163
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02906	0.04113	0.29231

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)	0.03200	0.03202	0.03203
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.03120	0.03105	0.02943
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.03351	0.03349	0.03263
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.03626	0.04864	0.30933
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)	0.03046	0.03048	0.03048
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.02965	0.02949	0.02787
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.03196	0.03194	0.03108
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.03470	0.04708	0.30777

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)	0.02128	0.04084	0.38527
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02223	0.04317	0.43027
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03025	0.05106	0.43630
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02493	0.04437	0.38951
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03276	0.06739	0.67563
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01974	0.03930	0.38372
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02067	0.04162	0.42872
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02869	0.04951	0.43475
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02340	0.04283	0.38798
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03122	0.06586	0.67408

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)	0.06567	0.08716	0.55299
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.03511	0.05693	0.40661
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.05100	0.07182	0.44812
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.05549	0.07647	0.45460
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.06719	0.10547	0.65630
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.04214	0.06331	0.41296
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03838	0.07694	0.69742
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.06414	0.08563	0.55145
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.03357	0.05539	0.40505
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.04946	0.07028	0.44658
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.05395	0.07493	0.45307
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.06563	0.10392	0.65472
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.04060	0.06178	0.41142
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.03683	0.07539	0.69585

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00408	0.00708	0.01168	2.44725	2.42428
sky130_osu_sc_15T_ms__dffs_l	0.00408	0.00708	0.01168	1.84533	1.83086

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	2055.43000	2877.72000
sky130_osu_sc_15T_ms__dffs_l	0.00000	1879.25000	2701.29000

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)	0.16202	1.08199	15.93760
	QN->Q (FR)	0.02180	0.65648	10.94140
	SN->Q (FR)	0.11953	1.07412	16.21170
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.15543	1.12697	15.20250
	QN->Q (FR)	0.02174	0.66551	10.36260
	SN->Q (FR)	0.11318	1.11415	15.45190

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)	0.22273	1.14955	16.28260
	QN->Q (RF)	0.02236	0.63329	10.57330
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.21698	1.20938	15.77640
	QN->Q (RF)	0.02144	0.62331	9.70601

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)	0.19730	0.61670	6.66283
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.19221	0.64893	6.69479

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)	0.13918	0.57848	6.83500
	SN->QN (FF)	0.09673	0.57112	7.10848
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.13160	0.58708	6.45325
	SN->QN (FF)	0.08935	0.57489	6.69702

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)	-0.04218	-0.04441	-0.00645
	setup	CK (R)	0.12428	0.16196	1.23845
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.04409	-0.04428	-0.00564
	setup	CK (R)	0.12455	0.16395	1.41674

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)	-0.07482	-0.18302	0.62140
	setup	CK (R)	0.09941	0.19893	2.95761
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07618	-0.18623	0.85112
	setup	CK (R)	0.09915	0.19893	2.95590

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)	-0.04218	-0.04441	-0.00645
	setup	CK (R)	0.12428	0.16196	1.23845
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.04409	-0.04428	-0.00564
	setup	CK (R)	0.12455	0.16395	1.41674

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)	-0.07482	-0.18302	0.62140
	setup	CK (R)	0.09941	0.19893	2.95761
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.07618	-0.18623	0.85112
	setup	CK (R)	0.09915	0.19893	2.95590

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)	0.03120	0.05449	1.99859
	removal	CK (R)	-0.01764	-0.03581	-0.15916
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03066	0.05521	1.92589
	removal	CK (R)	-0.01764	-0.03581	-0.15916

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)	0.03120	0.05449	1.99859
	removal	CK (R)	-0.01764	-0.03581	-0.15916
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03066	0.05521	1.92589
	removal	CK (R)	-0.01764	-0.03581	-0.15916

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 ()	0.08303	0.47852	13.33370
	min_pulse_width	SN ()	0.08662	0.47852	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.08303	0.47852	13.33370
	min_pulse_width	SN ()	0.07943	0.47852	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 ()	0.07584	0.47852	13.33370
	min_pulse_width	CK ()	0.11179	0.47852	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.07584	0.47852	13.33370
	min_pulse_width	CK ()	0.10819	0.47852	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 ()	0.16212	0.47852	13.33370
	min_pulse_width	CK ()	0.08303	0.47852	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.16212	0.47852	13.33370
	min_pulse_width	CK ()	0.08303	0.47852	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	0.04629	0.06056	0.26117
	SN	-0.00155	-0.12476	-2.32584
	SN	0.04077	0.05355	0.24337
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.04079	0.05617	0.28021
	SN	-0.00155	-0.10533	-1.75387
	SN	0.03567	0.04965	0.26176

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	0.06444	0.07038	0.18588
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.05777	0.06582	0.22337

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	0.05343	0.05930	0.17480
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.04964	0.05767	0.21502

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	0.03750	0.05182	0.25300
	SN	-0.00155	-0.12405	-2.30382
	SN	0.03634	0.04919	0.23858
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.03238	0.04780	0.27064
	SN	-0.00155	-0.10483	-1.74005
	SN	0.03186	0.04585	0.25667

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	0.02064	0.02064	0.02064
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03234	0.04778	0.34361
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01874	0.03193	0.29473
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01911	0.01910	0.01911
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03080	0.04624	0.34207
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01721	0.03040	0.29319

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	0.02967	0.02958	0.02948
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.04618	0.06147	0.34886
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.02154	0.03630	0.30286
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.02814	0.02804	0.02794
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.04464	0.05993	0.34732
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.02000	0.03477	0.30132

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)	0.00973	0.00966	0.00967
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.02595	0.03844	0.28915
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00820	0.00813	0.00814
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.02442	0.03691	0.28762

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)	0.02406	0.02398	0.02394
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.02407	0.03888	0.30093
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)	0.02252	0.02244	0.02240
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.02253	0.03734	0.29940

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)	0.01601	0.03562	0.38028
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02350	0.04299	0.38840
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02626	0.06146	0.67125
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01447	0.03409	0.37873
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02197	0.04146	0.38686
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02473	0.05993	0.66970

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)	0.05708	0.07882	0.54910
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02983	0.05170	0.40160
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.05899	0.09772	0.64747
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.04081	0.06212	0.41195
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.03242	0.07149	0.69343
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.05555	0.07728	0.54756
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02829	0.05017	0.40005
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.05745	0.09618	0.64591
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.03928	0.06059	0.41041
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.03089	0.06995	0.69187

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00424	0.01161	2.65104	2.63317
sky130_osu_sc_15T_ms__dff_l	0.00424	0.01161	1.61347	1.58994

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	2003.64000	2484.80000
sky130_osu_sc_15T_ms__dff_l	0.00000	1826.74000	2307.78000

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)	0.14300	1.07129	16.59310
	QN->Q (FR)	0.01895	0.59711	10.10460
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.14291	1.08218	13.90990
	QN->Q (FR)	0.02483	0.71906	10.80520

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)	0.19675	1.12183	16.82090
	QN->Q (RF)	0.02206	0.65424	11.23520
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.19882	1.15475	14.45880
	QN->Q (RF)	0.02160	0.59103	8.86736

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)	0.17207	0.56977	6.52487
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.17488	0.63296	6.42612

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)	0.12238	0.58020	7.41420
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.11815	0.54347	5.62597

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)	-0.04013	-0.03979	-0.03753
	setup	CK (R)	0.10382	0.14495	1.74830
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.04018	-0.03979	-0.03831
	setup	CK (R)	0.10317	0.14549	1.81574

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)	-0.06969	-0.18897	1.36465
	setup	CK (R)	0.08524	0.20291	2.94134
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.06978	-0.18897	1.27451
	setup	CK (R)	0.08524	0.20291	2.94146

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 ()	0.06865	0.47852	13.33370
	min_pulse_width	CK ()	0.10460	0.47852	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.06865	0.47852	13.33370
	min_pulse_width	CK ()	0.10460	0.47852	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 ()**	0.14055	0.47852	13.33370
	min_pulse_width	**CK ()**	0.06865	0.47852	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.14055	0.47852	13.33370
	min_pulse_width	**CK ()**	0.06865	0.47852	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	0.04659	0.06126	0.26421
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.04038	0.05632	0.28711

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	0.05770	0.06602	0.21564
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.04785	0.05484	0.19411

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	0.04618	0.05449	0.20448
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.04323	0.05025	0.19004

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	0.03967	0.05440	0.25692
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.03086	0.04678	0.27578

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	0.01380	0.01320	0.01666
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02924	0.04471	0.34475
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01226	0.01166	0.01512
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02770	0.04318	0.34322

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	0.02603	0.02595	0.02511
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.04309	0.05841	0.34974
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02449	0.02441	0.02357
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.04156	0.05687	0.34821

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)	0.01599	0.03563	0.38024
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01934	0.03885	0.38427
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01445	0.03410	0.37868
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01781	0.03731	0.38273

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)	0.02970	0.05160	0.40144
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.05405	0.07612	0.55164
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.05780	0.09732	0.65553
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.03651	0.05775	0.40765
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02816	0.05005	0.39988
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.05251	0.07459	0.55019
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.05627	0.09578	0.65399
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.03497	0.05621	0.40611

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00407	2.48875
sky130_osu_sc_15T_ms__inv_10	0.03761	21.56015
sky130_osu_sc_15T_ms__inv_2	0.00771	4.74307
sky130_osu_sc_15T_ms__inv_3	0.01148	6.97769
sky130_osu_sc_15T_ms__inv_4	0.01516	9.33129
sky130_osu_sc_15T_ms__inv_6	0.02272	13.71228
sky130_osu_sc_15T_ms__inv_8	0.03017	17.68175
sky130_osu_sc_15T_ms__inv_l	0.00306	1.45840

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	299.58300	598.05300
sky130_osu_sc_15T_ms__inv_10	0.00000	2991.19000	5971.95000
sky130_osu_sc_15T_ms__inv_2	0.00000	598.86700	1195.65000
sky130_osu_sc_15T_ms__inv_3	0.00000	897.92800	1792.66000
sky130_osu_sc_15T_ms__inv_4	0.00000	1197.22000	2390.27000
sky130_osu_sc_15T_ms__inv_6	0.00000	1795.45000	3584.64000
sky130_osu_sc_15T_ms__inv_8	0.00000	2393.59000	4778.83000
sky130_osu_sc_15T_ms__inv_l	0.00000	211.19200	419.87600

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)**	0.01805	0.54252	9.03552
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.02700	0.32311	8.72953
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01502	0.44926	8.77565
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.01661	0.41643	8.91259
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.01700	0.38641	8.86275
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.01955	0.35410	8.84765
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02294	0.33298	8.73167
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.02113	0.57656	8.40286

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)**	0.02008	0.56948	9.56706
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03016	0.33730	9.14499
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01667	0.47222	9.32283
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01835	0.43996	9.51873
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01833	0.40801	9.47345
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02207	0.37452	9.43900
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02585	0.35220	9.27984
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.01997	0.51790	7.55625

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	0.00652	0.01556	0.11646
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.06050	0.18347	1.11727
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01164	0.03219	0.22818
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01789	0.04985	0.33382
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02305	0.06752	0.44416
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03481	0.10621	0.66435
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04705	0.14566	0.88836
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00491	0.01309	0.11834

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	0.01510	0.02087	0.08011
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	0.14850	0.23699	0.80106
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	0.02836	0.04230	0.16092
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	0.04429	0.06552	0.23649
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	0.05829	0.08889	0.31511
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	0.08740	0.13885	0.47173
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	0.11670	0.18617	0.63899
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	0.00860	0.01388	0.08215

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.09869	0.09854	0.00830	0.09187

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	598.50600	599.17200

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)	-	0.00981	0.05396	0.24014
	A1->Y (RR)	-	0.01049	0.05428	0.24019
	S0->Y (RR)	(!A0 * A1)	0.03694	0.14764	0.55478
	S0->Y (FR)	(A0 * !A1)	0.02377	0.15152	0.96313

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)	-	0.00940	0.05776	0.25001
	A1->Y (FF)	-	0.00903	0.05746	0.24995
	S0->Y (FF)	(!A0 * A1)	0.03864	0.15671	0.61341
	S0->Y (RF)	(A0 * !A1)	0.02350	0.14943	0.88638

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	-	-0.00659	-0.00660	-0.00661
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00943	0.00941	0.00940
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00748	0.03036	0.37764
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00098	0.01982	0.36306

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	-	0.00664	0.00664	0.00666
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.01815	0.01815	0.01817
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00657	0.02824	0.37088
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01783	0.03961	0.38631

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)	0.00372	0.00371	0.00371

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)	0.00669	0.00669	0.00669

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)	-0.00171	-0.00172	-0.00172

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)	0.00173	0.00172	0.00172

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)	0.00348	0.02472	0.36676
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00351	0.02489	0.36719

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)	0.01355	0.03582	0.38229
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01194	0.03496	0.38179

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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_1	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00407	0.00405	1.66438
sky130_osu_sc_15T_ms__nand2_1	0.00306	0.00307	1.37986

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	299.01700	1193.80000
sky130_osu_sc_15T_ms__nand2_1	0.00000	210.85100	838.53700

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)	0.01857	0.46692	7.00720
	B->Y (FR)	0.02175	0.46359	6.90012
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.02172	0.56084	8.05957
	B->Y (FR)	0.02609	0.56441	8.05109

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)	0.02822	0.62364	9.37910
	B->Y (RF)	0.03203	0.59377	8.89028
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.02744	0.64328	9.23072
	B->Y (RF)	0.03071	0.61382	8.74966

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	0.00692	0.01525	0.11879
	B	0.00000	0.00000	0.00000
	B	0.00893	0.01751	0.12824
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00520	0.01194	0.10068
	B	0.00000	0.00000	0.00000
	B	0.00665	0.01362	0.10714

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	0.03207	0.03665	0.09340
	B	0.00000	0.00000	0.00000
	B	0.03136	0.03544	0.09251
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.02254	0.02639	0.07895
	B	0.00000	0.00000	0.00000
	B	0.02204	0.02566	0.07838

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)	-0.00488	-0.00491	-0.00491
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00333	-0.00336	-0.00337

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)	0.00491	0.00501	0.00493
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00338	0.00345	0.00339

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)	-0.00451	-0.00455	-0.00452
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00309	-0.00311	-0.00309

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)	0.00474	0.00463	0.00455
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00329	0.00321	0.00315

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00406	0.00433	1.42594
sky130_osu_sc_15T_ms__nor2_l	0.00297	0.00328	0.98593

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	240.41000	594.25600
sky130_osu_sc_15T_ms__nor2_l	0.00000	187.55400	417.85300

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)	0.03625	0.57884	8.23366
	B->Y (FR)	0.02643	0.60853	8.78391
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.03774	0.62149	7.98102
	B->Y (FR)	0.03022	0.66158	8.66243

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)	0.02877	0.47093	6.64078
	B->Y (RF)	0.02176	0.46004	6.60898
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02624	0.44983	5.77261
	B->Y (RF)	0.02145	0.44082	5.73228

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	0.00991	0.01639	0.11944
	B	0.00000	0.00000	0.00000
	B	0.00711	0.01572	0.13075
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00702	0.01329	0.11531
	B	0.00000	0.00000	0.00000
	B	0.00533	0.01275	0.11931

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	0.00774	0.01339	0.09604
	B	0.00000	0.00000	0.00000
	B	0.01096	0.01690	0.09202
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00587	0.01110	0.09342
	B	0.00000	0.00000	0.00000
	B	0.00726	0.01263	0.08739

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)	-0.00269	-0.00329	0.00018
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00176	-0.00205	0.00037

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)	0.00958	0.00952	0.00868
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00654	0.00652	0.00604

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)	-0.00151	-0.00151	-0.00103
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00094	-0.00094	-0.00041

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)	0.00501	0.00490	0.00343
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00399	0.00391	0.00279

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00408	0.00420	0.00345	1.35095

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	277.65700	1011.28000

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)	0.03699	0.61365	8.59982
	A1->Y (FR)	0.04960	0.59051	8.09477
	B0->Y (FR)	0.02461	0.52859	7.48348

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)	0.03935	0.56469	7.83835
	A1->Y (RF)	0.04883	0.55809	7.60186
	B0->Y (RF)	0.02985	0.60952	8.64499

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	0.01007	0.01688	0.11225
	A1	0.00000	0.00000	0.00000
	A1	0.01287	0.01830	0.10977
	B0	0.00578	0.01351	0.11552

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	0.02534	0.02880	0.08428
	A1	0.00000	0.00000	0.00000
	A1	0.01995	0.02330	0.08589
	B0	0.01101	0.01605	0.08293

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)	0.00213	0.00214	0.00263
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00441	-0.00439	-0.00440
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00439	-0.00441	-0.00440

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)	0.00866	0.00856	0.00708
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00441	0.00445	0.00443
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00462	0.00445	0.00443

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)	0.00109	0.00048	0.00391
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00435	-0.00436	-0.00434
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00434	-0.00435	-0.00434

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)	0.01313	0.01309	0.01222
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00436	0.00440	0.00438
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00455	0.00439	0.00438

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)	-0.00342	-0.00344	-0.00350

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)	0.00351	0.00354	0.00353

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00399	0.00418	0.00428	0.00421	1.39810

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	360.11000	1186.07000

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)	0.05325	0.58957	8.10489
	A1->Y (FR)	0.04333	0.61889	8.67103
	B0->Y (FR)	0.02885	0.60503	8.65683
	B1->Y (FR)	0.03943	0.57460	8.08661

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)	0.06946	0.60874	8.14435
	A1->Y (RF)	0.05538	0.58986	8.05732
	B0->Y (RF)	0.04720	0.63553	8.86527
	B1->Y (RF)	0.06156	0.65795	8.99296

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	0.01553	0.02115	0.11293
	A1	0.01272	0.02021	0.12563
	B0	0.00758	0.01524	0.11800
	B1	0.01054	0.01605	0.10423

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.02522	0.02837	0.08762
	A1	0.02805	0.03131	0.08537
	B0	0.02888	0.03304	0.08719
	B1	0.01043	0.01483	0.08274

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)	-0.00235	-0.00296	0.00050
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00016	-0.00045	0.00301
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00436	-0.00436	-0.00435
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00434	-0.00437	-0.00434

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)	0.00992	0.00985	0.00901
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.01243	0.01236	0.01152
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00439	0.00442	0.00439
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00463	0.00448	0.00440

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)	-0.00116	-0.00116	-0.00068
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00136	0.00136	0.00184
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00432	-0.00432	-0.00432
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00431	-0.00433	-0.00431

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)	0.00532	0.00521	0.00374
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00784	0.00773	0.00626
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00435	0.00437	0.00436
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00460	0.00438	0.00437

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)	-0.00115	-0.00115	-0.00067
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00137	0.00137	0.00185
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00483	-0.00485	-0.00483
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00471	-0.00474	-0.00482

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)	0.00529	0.00520	0.00372
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00781	0.00773	0.00624
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00495	0.00498	0.00490
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00484	0.00487	0.00486

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)	-0.00230	-0.00289	0.00058
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00021	-0.00037	0.00309
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00493	-0.00494	-0.00492
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00481	-0.00481	-0.00492

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)	0.00983	0.00976	0.00893
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.01234	0.01228	0.01144
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00505	0.00508	0.00500
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00493	0.00493	0.00495

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00445	0.00420	2.64950
sky130_osu_sc_15T_ms__or2_2	0.00446	0.00420	5.18907
sky130_osu_sc_15T_ms__or2_4	0.00446	0.00420	9.95810
sky130_osu_sc_15T_ms__or2_8	0.00448	0.00422	18.86020
sky130_osu_sc_15T_ms__or2_l	0.00341	0.00314	1.58885

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	390.89100	600.70100
sky130_osu_sc_15T_ms__or2_2	0.00000	541.19100	1198.90000
sky130_osu_sc_15T_ms__or2_4	0.00000	841.71500	2394.69000
sky130_osu_sc_15T_ms__or2_8	0.00000	1442.60000	4785.66000
sky130_osu_sc_15T_ms__or2_l	0.00000	294.43700	425.40800

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)	0.05551	0.45492	6.61542
	B->Y (RR)	0.04634	0.42708	6.46731
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.06150	0.40363	6.59868
	B->Y (RR)	0.05223	0.37742	6.42623
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.08064	0.40014	6.69637
	B->Y (RR)	0.07108	0.37684	6.52412
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.12026	0.44226	6.82038
	B->Y (RR)	0.11039	0.42270	6.66475
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.05445	0.47130	5.82293
	B->Y (RR)	0.04682	0.44606	5.60898

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)	0.07286	0.53083	7.85698
	B->Y (FF)	0.06008	0.54077	8.27385
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.08469	0.47647	7.88083
	B->Y (FF)	0.07191	0.48872	8.30035
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.11911	0.47669	7.99627
	B->Y (FF)	0.10637	0.49321	8.40843
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.19122	0.53557	7.97582
	B->Y (FF)	0.17854	0.55968	8.37056
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.07442	0.51335	6.40129
	B->Y (FF)	0.06244	0.53123	6.82984

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	0.01600	0.02859	0.24108
	B	0.00000	0.00000	0.00000
	B	0.02089	0.03557	0.26636
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.02217	0.03552	0.25157
	B	0.00000	0.00000	0.00000
	B	0.02675	0.04191	0.27515
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03742	0.05103	0.27005
	B	0.00000	0.00000	0.00000
	B	0.04136	0.05693	0.29255
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.08181	0.09023	0.31899
	B	0.00000	0.00000	0.00000
	B	0.08444	0.09559	0.33067
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01249	0.02263	0.18042
	B	0.00000	0.00000	0.00000
	B	0.01475	0.02560	0.18972

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	0.03264	0.04546	0.26894
	B	0.00000	0.00000	0.00000
	B	0.02968	0.04680	0.32323
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.05571	0.06593	0.28360
	B	0.00000	0.00000	0.00000
	B	0.05287	0.06698	0.33691
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.11054	0.11025	0.31159
	B	0.00000	0.00000	0.00000
	B	0.10798	0.11118	0.36396
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.24182	0.20527	0.36913
	B	0.00000	0.00000	0.00000
	B	0.23996	0.20647	0.41984
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.02118	0.03229	0.22881
	B	0.00000	0.00000	0.00000
	B	0.01927	0.03290	0.25464

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)	-0.00267	-0.00328	0.00017
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00264	-0.00327	0.00018
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00263	-0.00325	0.00020
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00258	-0.00321	0.00024
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00169	-0.00202	0.00037

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)	0.00963	0.00954	0.00871
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00964	0.00955	0.00872
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00966	0.00957	0.00874
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00969	0.00960	0.00877
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00660	0.00656	0.00608

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)	-0.00150	-0.00150	-0.00105
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00150	-0.00149	-0.00104
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00148	-0.00147	-0.00103
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00144	-0.00143	-0.00099
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00097	-0.00098	-0.00045

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)	0.00506	0.00495	0.00348
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00507	0.00496	0.00349
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00508	0.00498	0.00351
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00512	0.00501	0.00354
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00407	0.00400	0.00288

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00431	0.00558	1.45139
sky130_osu_sc_15T_ms__tbufi_l	0.00328	0.00430	0.97085

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	299.47000	1190.80000
sky130_osu_sc_15T_ms__tbufi_l	0.00000	212.41100	836.99100

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)	0.02550	0.60279	8.74564
	OE->Y (FR)	0.03407	0.37334	5.34283
	OE->Y (RR)	0.05501	0.50962	6.53476
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.02940	0.65047	8.47255
	OE->Y (FR)	0.03515	0.37321	5.34268
	OE->Y (RR)	0.05432	0.53599	5.98160

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)	0.02806	0.58921	8.51776
	OE->Y (FF)	0.03452	0.37334	5.34283
	OE->Y (RF)	0.02600	0.54026	7.80793
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.02759	0.55649	7.22669
	OE->Y (FF)	0.03555	0.37321	5.34268
	OE->Y (RF)	0.02563	0.50248	6.39628

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	0.02324	0.03031	0.12178
	OE	0.00000	0.00000	0.00000
	OE	0.02215	0.04149	0.34750
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.01645	0.02248	0.10954
	OE	0.00000	0.00000	0.00000
	OE	0.01525	0.03196	0.29056

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	0.02920	0.03384	0.09197
	OE	0.00000	0.00000	0.00000
	OE	0.03370	0.05437	0.38661
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.01811	0.02244	0.08376
	OE	0.00000	0.00000	0.00000
	OE	0.02084	0.03929	0.32897

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)	-0.00355	-0.00361	-0.00344
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00256	-0.00258	-0.00236
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00265	-0.00267	-0.00256
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00187	-0.00188	-0.00170

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)	0.00365	0.00364	0.00345
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00392	0.00392	0.00356
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00283	0.00283	0.00265
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00314	0.00314	0.00290

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)	0.01329	0.03497	0.37976
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00780	0.02970	0.37684
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00913	0.02833	0.32584
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00534	0.02477	0.32375

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)	0.00858	0.03153	0.38504
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00773	0.03071	0.38221
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00655	0.02671	0.33032
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00598	0.02611	0.32828

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00430	0.00663	1.45349
sky130_osu_sc_15T_ms__tnbufi_l	0.00328	0.00479	0.98199

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	498.72000	599.08000
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	351.81100	422.26500

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)	0.02555	0.60279	8.74944
	OE->Y (RR)	0.02704	0.37424	5.34372
	OE->Y (FR)	0.03394	0.55303	7.88942
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.02945	0.65326	8.53716
	OE->Y (RR)	0.02540	0.37415	5.34359
	OE->Y (FR)	0.03635	0.58950	7.41723

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)	0.02766	0.58942	8.52655
	OE->Y (RF)	0.02675	0.37425	5.34372
	OE->Y (FF)	0.04112	0.46705	6.14042
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.02714	0.55895	7.28485
	OE->Y (RF)	0.02511	0.37415	5.34359
	OE->Y (FF)	0.04254	0.46708	5.36885

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	0.00692	0.01410	0.10769
	OE	0.00000	0.00000	0.00000
	OE	0.01736	0.04082	0.38689
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00526	0.01140	0.09973
	OE	0.00000	0.00000	0.00000
	OE	0.01257	0.03263	0.32745

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	0.01380	0.01849	0.07698
	OE	0.00000	0.00000	0.00000
	OE	0.02841	0.05001	0.35973
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00857	0.01291	0.07401
	OE	0.00000	0.00000	0.00000
	OE	0.01889	0.03795	0.31241

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	0.00211	0.00231
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00315	0.00313	0.00334
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00149	0.00146	0.00158
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00227	0.00225	0.00243

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)	0.00832	0.00833	0.00813
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00863	0.00863	0.00826
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00598	0.00598	0.00579
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00629	0.00629	0.00604

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)	0.00082	0.02317	0.37311
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00026	0.02236	0.36973
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00091	0.02071	0.32156
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00012	0.02006	0.31918

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)	0.01837	0.04229	0.39303
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01292	0.03729	0.38937
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01312	0.03383	0.33548
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00937	0.03049	0.33294

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00856	0.00769	1.45936

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	1060.11000	1785.00000

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.06828	0.52961	6.55547
	A->Y (FR)	!B	0.03294	0.60189	8.65775
	B->Y (RR)	A	0.05456	0.52630	6.78394
	B->Y (FR)	!A	0.04611	0.58033	8.16347

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.07332	0.52291	6.44054
	A->Y (RF)	!B	0.03766	0.56906	8.11788
	B->Y (FF)	A	0.06146	0.51440	6.47469
	B->Y (RF)	!A	0.04760	0.57875	8.09359

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	0.03767	0.05673	0.37144
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01660	0.04544	0.48259
	B	A	0.00000	0.00000	0.00000
	B	A	0.03246	0.05473	0.40959
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01861	0.04557	0.46450

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	0.04959	0.07062	0.41313
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.04874	0.07282	0.46345
	B	A	0.00000	0.00000	0.00000
	B	A	0.06000	0.08211	0.42881
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.03692	0.06123	0.45249

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	0.00861	0.00774	1.45554

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	1059.95000	1848.07000

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	0.06549	0.53494	6.82388
	A->Y (FR)	B	0.04330	0.58966	8.37401
	B->Y (RR)	!A	0.05720	0.53436	6.86702
	B->Y (FR)	A	0.04720	0.59022	8.30842

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	0.06321	0.51274	6.23535
	A->Y (RF)	B	0.04127	0.60262	8.50538
	B->Y (FF)	!A	0.05979	0.51707	6.49831
	B->Y (RF)	A	0.04748	0.57907	8.07712

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	0.03652	0.06372	0.48704
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01887	0.03879	0.38219
	B	A	0.00000	0.00000	0.00000
	B	A	0.03716	0.06390	0.47511
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01750	0.03925	0.39230

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	0.05065	0.07544	0.47087
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.04849	0.06857	0.37215
	B	A	0.00000	0.00000	0.00000
	B	A	0.04945	0.07289	0.45627
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.04654	0.06867	0.41186

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ff_1P95_150C.ccs
Cell Library: Process , Voltage 1.95, 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	1.14945
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	451978.00000	903955.00000
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
	-0.00044	0.15687	2.20794

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
	7.86503	7.50384	2.55009