sky130_osu_sc_18T_ms_ss_1P60_100C.ccs Library

Cell Groups
SKY130_OSU_SC_18T_MS__ADDFx
SKY130_OSU_SC_18T_MS__ADDHx
SKY130_OSU_SC_18T_MS__AND2x
SKY130_OSU_SC_18T_MS__AOI21
SKY130_OSU_SC_18T_MS__AOI22
SKY130_OSU_SC_18T_MS__BUFx
SKY130_OSU_SC_18T_MS__DFFRx
SKY130_OSU_SC_18T_MS__DFFSRx
SKY130_OSU_SC_18T_MS__DFFSx
SKY130_OSU_SC_18T_MS__DFFx
SKY130_OSU_SC_18T_MS__INVx
SKY130_OSU_SC_18T_MS__MUX2
SKY130_OSU_SC_18T_MS__NAND2x
SKY130_OSU_SC_18T_MS__NOR2x
SKY130_OSU_SC_18T_MS__OAI21
SKY130_OSU_SC_18T_MS__OAI22
SKY130_OSU_SC_18T_MS__OR2x
SKY130_OSU_SC_18T_MS__TBUFIx
SKY130_OSU_SC_18T_MS__TNBUFIx
SKY130_OSU_SC_18T_MS__XNOR2
SKY130_OSU_SC_18T_MS__XOR2
SKY130_OSU_SC_18T_MS_x

SKY130_OSU_SC_18T_MS__ADDFx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__addf_1	46.88640
sky130_osu_sc_18T_ms__addf_l	46.88640

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	**B**	**CI**	**CO**	**CON**	**S**
sky130_osu_sc_18T_ms__addf_1	0.02251	0.02247	0.01713	2.04744	0.96035	2.00910
sky130_osu_sc_18T_ms__addf_l	0.02250	0.02247	0.01712	1.48430	0.96402	1.48123

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.66960	0.85551
sky130_osu_sc_18T_ms__addf_l	0.00000	0.72571	0.91162

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.24779	2.37522	30.41240
	B->CO (RR)	0.21013	2.26503	29.31120
	CI->CO (RR)	0.23592	2.40658	30.96920
	CON->CO (FR)	0.03917	0.85863	11.25200
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.24464	2.19942	25.05860
	B->CO (RR)	0.24105	2.13936	24.34100
	CI->CO (RR)	0.23264	2.23184	25.62570
	CON->CO (FR)	0.04198	0.90990	11.06290

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.30423	2.76339	35.23250
	B->CO (FF)	0.27475	2.65735	34.23160
	CI->CO (FF)	0.26814	2.73292	35.37430
	CON->CO (RF)	0.03836	0.84376	11.02190
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.29994	2.57104	29.08240
	B->CO (FF)	0.27057	2.47554	28.36610
	CI->CO (FF)	0.26388	2.54087	29.24550
	CON->CO (RF)	0.04226	0.91477	11.12390

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (FR)	0.20733	1.13430	10.60930
	B->CON (FR)	0.18088	1.08026	10.47550
	CI->CON (FR)	0.17123	1.10561	10.82190
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.19654	1.12485	10.62830
	B->CON (FR)	0.17066	1.07131	10.49000
	CI->CON (FR)	0.16042	1.09641	10.83710

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (RF)	0.16651	0.96161	9.19976
	B->CON (RF)	0.16479	0.96074	9.32233
	CI->CON (RF)	0.15479	0.99503	9.79717
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.15972	0.95604	9.21295
	B->CON (RF)	0.15843	0.95566	9.33540
	CI->CON (RF)	0.14797	0.98954	9.81163

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-R)	0.44066	2.51865	27.03440
	B->S (-R)	0.47890	2.56325	26.52340
	CI->S (-R)	0.40231	2.48197	27.17220
	CON->S (RR)	0.12998	0.87564	8.35097
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.41641	2.31374	22.59280
	B->S (-R)	0.45488	2.36562	22.30460
	CI->S (-R)	0.37780	2.27774	22.74750
	CON->S (RR)	0.12584	0.89819	8.03879

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-F)	0.40808	2.25356	23.02520
	B->S (-F)	0.38892	2.14457	22.19470
	CI->S (-F)	0.39489	2.27844	23.57370
	CON->S (FF)	0.15815	0.89329	7.61486
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.39029	2.11904	19.92610
	B->S (-F)	0.37713	2.02424	19.41160
	CI->S (-F)	0.37687	2.14422	20.48210
	CON->S (FF)	0.15538	0.94507	7.77450

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00347	0.00400	0.01334
	B	0.00564	0.00585	0.01382
	CI	0.00575	0.00638	0.01583
sky130_osu_sc_18T_ms__addf_l	A	0.00253	0.00283	0.00901
	B	0.00470	0.00469	0.00992
	CI	0.00480	0.00520	0.01144

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01504	0.01559	0.02677
	B	0.01603	0.01661	0.02601
	CI	0.01252	0.01306	0.02471
sky130_osu_sc_18T_ms__addf_l	A	0.01411	0.01447	0.02218
	B	0.01508	0.01553	0.02171
	CI	0.01310	0.01381	0.02045

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01501	0.01531	0.02013
	B	0.01599	0.01639	0.02013
	CI	0.01403	0.01467	0.01896
sky130_osu_sc_18T_ms__addf_l	A	0.01409	0.01434	0.01908
	B	0.01505	0.01541	0.01907
	CI	0.01308	0.01369	0.01792

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00346	0.00377	0.00798
	B	0.00558	0.00555	0.00918
	CI	0.00571	0.00609	0.01039
sky130_osu_sc_18T_ms__addf_l	A	0.00251	0.00274	0.00669
	B	0.00465	0.00453	0.00794
	CI	0.00477	0.00506	0.00911

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01503	0.01558	0.02642
	B	0.01602	0.01660	0.02569
	CI	0.01252	0.01305	0.02434
sky130_osu_sc_18T_ms__addf_l	A	0.01411	0.01447	0.02218
	B	0.01507	0.01552	0.02180
	CI	0.01309	0.01380	0.02038

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.03396	0.03435	0.04167
	B	0.03029	0.03032	0.04320
	CI	0.02753	0.02771	0.03524
sky130_osu_sc_18T_ms__addf_l	A	0.03273	0.03283	0.04049
	B	0.02912	0.02902	0.04230
	CI	0.02634	0.02633	0.03418

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__addh_1	27.83880
sky130_osu_sc_18T_ms__addh_l	27.83880

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_18T_ms__addh_1	0.01109	0.01201	2.00184	1.00470	2.03720
sky130_osu_sc_18T_ms__addh_l	0.01110	0.01201	1.23870	1.00642	1.25086

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.75060	0.86097
sky130_osu_sc_18T_ms__addh_l	0.00000	0.43429	0.60662

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (RR)	0.16483	0.91817	8.25852
	B->CO (RR)	0.17148	0.90571	8.29142
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.16256	0.98650	8.10626
	B->CO (RR)	0.16910	0.97753	8.13414

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (FF)	0.13323	0.84021	7.42706
	B->CO (FF)	0.14136	0.85834	7.47176
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.13448	0.92627	7.50630
	B->CO (FF)	0.14227	0.94429	7.55107

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (RR)	B	0.22038	0.79282	4.85977
	A->CON (FR)	!B	0.11636	1.02938	10.68000
	B->CON (RR)	A	0.22631	0.77942	4.88805
	B->CON (FR)	!A	0.14490	1.05641	10.56530
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.19630	0.75634	4.77463
	A->CON (FR)	!B	0.10284	1.01547	10.67690
	B->CON (RR)	A	0.20235	0.74588	4.80099
	B->CON (FR)	!A	0.13136	1.04272	10.56210

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (FF)	B	0.21730	0.96712	6.69056
	A->CON (RF)	!B	0.09802	0.93126	9.79555
	B->CON (FF)	A	0.21068	1.00419	7.05758
	B->CON (RF)	!A	0.12061	0.92739	9.50935
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.19626	0.92010	6.46624
	A->CON (RF)	!B	0.08950	0.92263	9.79575
	B->CON (FF)	A	0.18963	0.95832	6.83680
	B->CON (RF)	!A	0.11226	0.92018	9.50992

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (RR)	!B	0.17156	2.28296	30.18420
	A->S (FR)	B	0.29172	2.30110	26.87630
	B->S (RR)	!A	0.19478	2.23737	29.14990
	B->S (FR)	A	0.28493	2.38172	27.98190
	CON->S (FR)	-	0.04292	0.87877	11.46610
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.16764	2.06076	23.10410
	A->S (FR)	B	0.27561	2.04824	19.64180
	B->S (RR)	!A	0.19127	2.03164	22.43420
	B->S (FR)	A	0.26859	2.11385	20.38560
	CON->S (FR)	-	0.04801	0.97446	11.35670

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (FF)	!B	0.19687	2.52117	33.42860
	A->S (RF)	B	0.28559	1.84704	20.44110
	B->S (FF)	!A	0.22560	2.55321	33.38650
	B->S (RF)	A	0.29149	1.83529	20.47080
	CON->S (RF)	-	0.03644	0.82349	10.74830
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.19138	2.26572	25.30520
	A->S (RF)	B	0.26725	1.71018	15.78550
	B->S (FF)	!A	0.22010	2.29505	25.21880
	B->S (RF)	A	0.27320	1.70073	15.81480
	CON->S (RF)	-	0.04311	0.93173	10.91080

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00680	0.00663	0.00942
	B	0.00000	0.00000	0.00000
	B	0.00605	0.00577	0.00855
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00550	0.00523	0.00900
	B	0.00000	0.00000	0.00000
	B	0.00475	0.00438	0.00799

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.01094	0.01073	0.01645
	B	0.00000	0.00000	0.00000
	B	0.01124	0.01162	0.01769
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00963	0.00932	0.01455
	B	0.00000	0.00000	0.00000
	B	0.00994	0.01012	0.01552

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00680	0.00663	0.01007
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00941	0.00960	0.01139
	B	A	0.00000	0.00000	0.00000
	B	A	0.00604	0.00578	0.00922
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01065	0.01071	0.01175
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00550	0.00522	0.00910
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00857	0.00868	0.01012
	B	A	0.00000	0.00000	0.00000
	B	A	0.00475	0.00438	0.00796
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00982	0.00979	0.01047

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01095	0.01072	0.01590
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00159	0.00166	0.00295
	B	A	0.00000	0.00000	0.00000
	B	A	0.01124	0.01155	0.01727
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00261	0.00252	0.00385
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00963	0.00933	0.01444
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00045	0.00045	0.00124
	B	A	0.00000	0.00000	0.00000
	B	A	0.00994	0.01013	0.01544
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00147	0.00131	0.00209

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01096	0.01075	0.01669
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00161	0.00178	0.00379
	B	A	0.00000	0.00000	0.00000
	B	A	0.01125	0.01164	0.01803
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00264	0.00262	0.00449
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00964	0.00934	0.01446
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00046	0.00047	0.00126
	B	A	0.00000	0.00000	0.00000
	B	A	0.00995	0.01013	0.01548
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00149	0.00132	0.00203

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00681	0.00663	0.00946
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00942	0.00969	0.01151
	B	A	0.00000	0.00000	0.00000
	B	A	0.00606	0.00578	0.00882
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01067	0.01083	0.01218
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00551	0.00524	0.00924
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00857	0.00870	0.01005
	B	A	0.00000	0.00000	0.00000
	B	A	0.00475	0.00438	0.00839
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00982	0.00983	0.01051

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__and2_1	12.45420
sky130_osu_sc_18T_ms__and2_2	15.38460
sky130_osu_sc_18T_ms__and2_4	21.24540
sky130_osu_sc_18T_ms__and2_6	27.10620
sky130_osu_sc_18T_ms__and2_8	32.96700
sky130_osu_sc_18T_ms__and2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__and2_1	0.00595	0.00606	2.02555
sky130_osu_sc_18T_ms__and2_2	0.00595	0.00606	3.95787
sky130_osu_sc_18T_ms__and2_4	0.00595	0.00606	7.66320
sky130_osu_sc_18T_ms__and2_6	0.00599	0.00606	11.19573
sky130_osu_sc_18T_ms__and2_8	0.00597	0.00608	14.63773
sky130_osu_sc_18T_ms__and2_l	0.00451	0.00462	1.48032

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.35649	0.56072
sky130_osu_sc_18T_ms__and2_2	0.00000	0.56106	0.56354
sky130_osu_sc_18T_ms__and2_4	0.00000	0.97898	1.11566
sky130_osu_sc_18T_ms__and2_6	0.00000	1.39689	1.66972
sky130_osu_sc_18T_ms__and2_8	0.00000	1.81481	2.22377
sky130_osu_sc_18T_ms__and2_l	0.00000	0.42841	0.67864

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	A->Y (RR)	0.12531	0.82596	8.01685
	B->Y (RR)	0.13362	0.82534	7.98647
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.14636	0.78971	8.19339
	B->Y (RR)	0.15471	0.77834	8.15735
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.20197	0.83817	8.64320
	B->Y (RR)	0.21032	0.81467	8.58942
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.25591	0.90140	8.91395
	B->Y (RR)	0.26405	0.87151	8.84706
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.30895	0.96644	9.26311
	B->Y (RR)	0.31727	0.93677	9.16593
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.13828	0.89791	7.94871
	B->Y (RR)	0.14753	0.89458	7.92806

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	A->Y (FF)	0.10248	0.74326	6.94503
	B->Y (FF)	0.10807	0.76389	7.00251
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.11771	0.70945	7.08417
	B->Y (FF)	0.12415	0.72566	7.15028
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.16340	0.75056	7.50397
	B->Y (FF)	0.17014	0.76239	7.57143
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.21258	0.80454	7.76553
	B->Y (FF)	0.21920	0.81485	7.82776
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.25834	0.85747	7.95834
	B->Y (FF)	0.26517	0.86617	8.01979
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.10790	0.83186	7.30092
	B->Y (FF)	0.11398	0.85395	7.37055

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00528	0.00512	0.01946
	B	0.00000	0.00000	0.00000
	B	0.00538	0.00471	0.01469
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01066	0.01085	0.02387
	B	0.00000	0.00000	0.00000
	B	0.01076	0.01051	0.01966
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02246	0.02302	0.03473
	B	0.00000	0.00000	0.00000
	B	0.02257	0.02288	0.03113
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03480	0.03526	0.04698
	B	0.00000	0.00000	0.00000
	B	0.03490	0.03468	0.04328
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04756	0.04773	0.05936
	B	0.00000	0.00000	0.00000
	B	0.04770	0.04735	0.05506
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00385	0.00370	0.01338
	B	0.00000	0.00000	0.00000
	B	0.00395	0.00342	0.01041

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.01302	0.01379	0.02940
	B	0.00000	0.00000	0.00000
	B	0.01464	0.01523	0.03005
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01626	0.01772	0.03318
	B	0.00000	0.00000	0.00000
	B	0.01793	0.01910	0.03378
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02462	0.02726	0.04276
	B	0.00000	0.00000	0.00000
	B	0.02625	0.02843	0.04312
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03294	0.03676	0.05259
	B	0.00000	0.00000	0.00000
	B	0.03472	0.03772	0.05257
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04193	0.04597	0.06247
	B	0.00000	0.00000	0.00000
	B	0.04359	0.04674	0.06177
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00992	0.01031	0.02060
	B	0.00000	0.00000	0.00000
	B	0.01111	0.01144	0.02125

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00504	-0.00503	-0.00508
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00504	-0.00504	-0.00508
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00503	-0.00504	-0.00507
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00505	-0.00505	-0.00509
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00502	-0.00501	-0.00506
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00365	-0.00367	-0.00367

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00507	0.00514	0.00510
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00508	0.00514	0.00510
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00508	0.00514	0.00511
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00511	0.00517	0.00513
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00509	0.00515	0.00512
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00367	0.00372	0.00369

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00481	-0.00485	-0.00482
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00481	-0.00484	-0.00482
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00480	-0.00484	-0.00482
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00480	-0.00483	-0.00481
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00479	-0.00483	-0.00481
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00348	-0.00351	-0.00349

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00486	0.00492	0.00484
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00487	0.00492	0.00485
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00488	0.00492	0.00485
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00488	0.00493	0.00485
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00489	0.00493	0.00486
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00352	0.00356	0.00350

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__aoi21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__aoi21_l	0.00567	0.00587	0.00567	0.96921

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.14353	0.28224

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (FR)	0.11311	1.04434	10.60760
	A1->Y (FR)	0.09799	1.00050	10.31990
	B0->Y (FR)	0.08095	1.01979	10.81300

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (RF)	0.09391	0.85956	8.81806
	A1->Y (RF)	0.08629	0.88087	9.30158
	B0->Y (RF)	0.05078	0.80375	8.86813

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.01186	0.01177	0.01285
	A1	0.00000	0.00000	0.00000
	A1	0.01011	0.01001	0.01107
	B0	0.00912	0.00907	0.01119

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00267	0.00221	0.00302
	A1	0.00000	0.00000	0.00000
	A1	0.00269	0.00235	0.00340
	B0	-0.00131	-0.00133	-0.00045

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00382	-0.00450	-0.00453
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00458	-0.00462	-0.00459
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00458	-0.00461	-0.00459

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00449	0.00452	0.00453
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00459	0.00464	0.00461
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00463	0.00465	0.00461

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00380	-0.00446	-0.00448
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00454	-0.00456	-0.00455
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00482	-0.00485	-0.00488

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00445	0.00449	0.00448
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00454	0.00457	0.00456
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00487	0.00497	0.00490

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00214	-0.00216	-0.00215

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00237	0.00238	0.00221

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__aoi22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__aoi22_1	0.00568	0.00588	0.00605	0.00582	0.92889

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.15885	0.55405

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (FR)	0.14245	1.07537	10.48370
	A1->Y (FR)	0.12774	1.04528	10.33560
	B0->Y (FR)	0.08513	1.00797	10.54020
	B1->Y (FR)	0.10009	1.04131	10.73970

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (RF)	0.12607	0.88163	8.63797
	A1->Y (RF)	0.11851	0.90234	9.12678
	B0->Y (RF)	0.06094	0.84371	9.06933
	B1->Y (RF)	0.06889	0.81707	8.58102

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.01458	0.01446	0.01544
	A1	0.01285	0.01274	0.01375
	B0	0.00976	0.00970	0.01250
	B1	0.01144	0.01140	0.01421

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00552	0.00504	0.00582
	A1	0.00554	0.00517	0.00621
	B0	-0.00091	-0.00092	0.00024
	B1	-0.00078	-0.00100	-0.00009

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00381	-0.00449	-0.00453
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00458	-0.00461	-0.00459
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00458	-0.00461	-0.00459
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00458	-0.00461	-0.00459

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00449	0.00453	0.00453
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00460	0.00464	0.00461
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00464	0.00465	0.00461
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00464	0.00465	0.00461

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00379	-0.00446	-0.00448
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00454	-0.00456	-0.00454
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00482	-0.00485	-0.00488
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00482	-0.00485	-0.00488

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00445	0.00449	0.00448
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00455	0.00458	0.00457
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00487	0.00493	0.00489
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00487	0.00493	0.00489

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00215	-0.00218	-0.00216
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00213	-0.00216	-0.00215
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00493	-0.00497	-0.00499
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00493	-0.00497	-0.00499

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00248	0.00249	0.00224
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00215	0.00216	0.00215
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00498	0.00507	0.00500
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00498	0.00498	0.00500

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00216	-0.00219	-0.00217
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00214	-0.00217	-0.00216
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00464	-0.00466	-0.00466
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00464	-0.00466	-0.00466

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00248	0.00250	0.00225
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00216	0.00218	0.00216
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00470	0.00470	0.00467
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00470	0.00470	0.00467

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__buf_1	9.52380
sky130_osu_sc_18T_ms__buf_2	12.45420
sky130_osu_sc_18T_ms__buf_4	18.31500
sky130_osu_sc_18T_ms__buf_6	24.17580
sky130_osu_sc_18T_ms__buf_8	30.03660
sky130_osu_sc_18T_ms__buf_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__buf_1	0.00606	2.03353
sky130_osu_sc_18T_ms__buf_2	0.00606	3.95162
sky130_osu_sc_18T_ms__buf_4	0.00606	7.65140
sky130_osu_sc_18T_ms__buf_6	0.00098	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00606	14.72924
sky130_osu_sc_18T_ms__buf_l	0.00466	1.49104

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.28890	0.28890
sky130_osu_sc_18T_ms__buf_2	0.00000	0.42622	0.56072
sky130_osu_sc_18T_ms__buf_4	0.00000	0.70799	1.11478
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	1.27154	2.22289
sky130_osu_sc_18T_ms__buf_l	0.00000	0.34501	0.34501

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (RR)**	0.08979	0.77380	7.88554
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.10067	0.71497	7.96175
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.13543	0.73428	8.32406
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.20128	0.81974	8.86998
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.09803	0.83836	7.78055

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (FF)**	0.09780	0.73322	6.95398
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.11398	0.70204	7.08633
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.15995	0.74398	7.49026
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.25495	0.85322	7.99828
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.10444	0.82365	7.34243

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00495	0.00461	0.01715
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01032	0.01044	0.02219
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02191	0.02272	0.03320
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04563	0.04718	0.05843
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00372	0.00340	0.01235

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.01257	0.01331	0.02895
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01581	0.01714	0.03253
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02418	0.02648	0.04182
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04147	0.04492	0.06094
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00966	0.01003	0.02052

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00062	-0.00063	-0.00061

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	0.00062	0.00063	0.00061

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__dffr_1	63.73620
sky130_osu_sc_18T_ms__dffr_l	63.73620

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_18T_ms__dffr_1	0.00582	0.00579	0.01668	1.98228	1.98520
sky130_osu_sc_18T_ms__dffr_l	0.00582	0.00579	0.01668	1.48718	1.48998

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	1.02650	1.40599
sky130_osu_sc_18T_ms__dffr_l	0.00000	1.08261	1.46210

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RR)	0.45569	1.91862	18.91440
	QN->Q (FR)	0.04431	0.93355	12.18030
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.44774	2.07743	19.30390
	QN->Q (FR)	0.04540	0.97142	11.83460

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RF)	0.46293	2.00021	20.09610
	QN->Q (RF)	0.04326	0.93523	12.16120
	RN->Q (FF)	0.34172	1.89097	19.85240
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.46280	2.17724	20.44250
	QN->Q (RF)	0.04568	0.99663	12.13330
	RN->Q (FF)	0.34221	2.06971	20.19140

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->QN (RR)	0.40179	1.12525	8.22849
	RN->QN (FR)	0.28050	1.01531	7.98878
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.39505	1.16082	8.08251
	RN->QN (FR)	0.27433	1.05116	7.83303

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	**CK->QN (RF)**	0.39258	1.08655	7.67221
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.38036	1.13890	7.91994

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.11490	-0.12933	-0.26650
	setup	CK (R)	0.35497	0.37037	0.96827
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11220	-0.12871	-0.26631
	setup	CK (R)	0.35779	0.37213	0.97864

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.17249	-0.44498	-2.29872
	setup	CK (R)	0.21710	0.46015	2.32795
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.17400	-0.44526	-2.29827
	setup	CK (R)	0.21707	0.46021	2.32792

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.11490	-0.12933	-0.26650
	setup	CK (R)	0.35497	0.37037	0.96827
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11220	-0.12871	-0.26631
	setup	CK (R)	0.35779	0.37213	0.97864

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.17249	-0.44498	-2.29872
	setup	CK (R)	0.21710	0.46015	2.32795
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.17400	-0.44526	-2.29827
	setup	CK (R)	0.21707	0.46021	2.32792

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.28140	0.30760	1.05339
	removal	CK (R)	-0.04940	-0.05727	-0.11972
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.27997	0.30945	1.05976
	removal	CK (R)	-0.04940	-0.05727	-0.11972

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.28140	0.30760	1.05339
	removal	CK (R)	-0.04940	-0.05727	-0.11972
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.27997	0.30945	1.05976
	removal	CK (R)	-0.04940	-0.05727	-0.11972

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	RN ()	0.20127	0.59204	13.33370
	min_pulse_width	RN ()	0.19906	0.59204	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.19465	0.59204	13.33370
	min_pulse_width	RN ()	0.19244	0.59204	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_18T_ms__dffr_1	min_pulse_width	CK ()	0.21010	0.59204	13.33370
	min_pulse_width	CK ()	0.24542	0.59204	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.19906	0.59204	13.33370
	min_pulse_width	CK ()	0.24101	0.59204	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_18T_ms__dffr_1	min_pulse_width	CK ()	0.44854	0.59204	13.33370
	min_pulse_width	CK ()	0.18361	0.59204	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.44854	0.59204	13.33370
	min_pulse_width	CK ()	0.18361	0.59204	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01264	0.01030	-0.00060
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01117	0.00945	0.00719

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01453	0.01284	0.00060
	RN	-0.00167	-0.08929	-1.26864
	RN	0.03335	0.03189	0.02134
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01304	0.01180	0.00857
	RN	-0.00167	-0.07515	-0.95179
	RN	0.03185	0.03082	0.02863

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01452	0.01284	0.00057
	RN	-0.00167	-0.08937	-1.26990
	RN	0.03333	0.03183	0.02067
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01303	0.01179	0.00832
	RN	-0.00167	-0.07523	-0.95291
	RN	0.03183	0.03083	0.02846

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01259	0.01029	-0.00057
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01112	0.00942	0.00699

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00370	-0.00442	-0.00451
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01542	0.01454	0.02217
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00700	0.00619	0.01415
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00370	-0.00442	-0.00451
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01542	0.01454	0.02217
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00700	0.00619	0.01415

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00450	0.00455	0.00453
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02663	0.02624	0.03514
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01252	0.01218	0.02096
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00450	0.00455	0.00453
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02663	0.02624	0.03514
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01252	0.01220	0.02096

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00480	0.00428	0.01892
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01337	0.01254	0.02708
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00480	0.00428	0.01892
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01337	0.01254	0.02708

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01154	0.01178	0.02861
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02505	0.02480	0.04147
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01154	0.01178	0.02861
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02505	0.02480	0.04147

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00169	0.01261
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00726	0.00599	0.02047
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00153	-0.00222	0.01197
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00169	0.01261
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00727	0.00598	0.02047
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00152	-0.00222	0.01197

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01789	0.01817	0.03510
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03965	0.03865	0.05557
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03057	0.03027	0.04637
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03916	0.03926	0.06989
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02081	0.02115	0.03743
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01789	0.01819	0.03510
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03965	0.03865	0.05557
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03057	0.03027	0.04637
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03916	0.03926	0.06989
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02081	0.02115	0.03743

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__dffsr_1	69.59700
sky130_osu_sc_18T_ms__dffsr_l	69.59700

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffsr_1	0.00578	0.00580	0.01236	0.01691	2.04193	2.05406
sky130_osu_sc_18T_ms__dffsr_l	0.00578	0.00580	0.01235	0.01691	1.48620	1.49443

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffsr_1	0.00000	1.04320	1.41341
sky130_osu_sc_18T_ms__dffsr_l	0.00000	1.09931	1.46953

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RR)	0.47188	1.92062	18.83960
	QN->Q (FR)	0.04245	0.91712	12.02160
	RN->Q (RR)	0.37425	1.84023	18.81580
	SN->Q (FR)	0.33886	1.82658	18.93750
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.47531	2.11340	19.35130
	QN->Q (FR)	0.04532	0.96918	11.80020
	RN->Q (RR)	0.37825	2.03444	19.32180
	SN->Q (FR)	0.34251	2.01711	19.42140

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RF)	0.53669	2.06150	20.08960
	QN->Q (RF)	0.03997	0.89255	11.66560
	RN->Q (FF)	0.35149	1.89229	19.83320
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.54148	2.26420	20.50990
	QN->Q (RF)	0.04559	0.99529	12.11700
	RN->Q (FF)	0.35723	2.09399	20.24660

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RR)	0.47605	1.20703	8.37320
	RN->QN (FR)	0.29200	1.03703	8.11880
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.47204	1.24797	8.18911
	RN->QN (FR)	0.28888	1.07865	7.92847

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RF)	0.41227	1.10334	7.66435
	RN->QN (RF)	0.31489	1.02348	7.63926
	SN->QN (FF)	0.27971	1.00952	7.75857
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.40929	1.17802	8.01552
	RN->QN (RF)	0.31242	1.09923	7.98567
	SN->QN (FF)	0.27693	1.08161	8.08591

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.12770	-0.14582	-0.34548
	setup	CK (R)	0.35818	0.36933	1.02852
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.12848	-0.14307	-0.34553
	setup	CK (R)	0.35897	0.37112	1.03101

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.20137	-0.47097	-2.41529
	setup	CK (R)	0.26584	0.48484	2.43869
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.20220	-0.46802	-2.41391
	setup	CK (R)	0.26591	0.48469	2.43959

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.12770	-0.14582	-0.34548
	setup	CK (R)	0.35818	0.36933	1.02852
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.12848	-0.14307	-0.34553
	setup	CK (R)	0.35897	0.37112	1.03101

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.20137	-0.47097	-2.41529
	setup	CK (R)	0.26584	0.48484	2.43869
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.20220	-0.46802	-2.41391
	setup	CK (R)	0.26591	0.48469	2.43959

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.25147	0.27203	1.00712
	removal	CK (R)	-0.03078	-0.03680	-0.08133
	hold	SN (R)	-0.26584	-0.50716	-2.12010
	setup	SN (R)	0.30013	0.57090	4.00587
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24977	0.27154	1.00597
	removal	CK (R)	-0.03078	-0.03680	-0.08133
	hold	SN (R)	-0.26023	-0.49622	-2.06441
	setup	SN (R)	0.30196	0.56160	3.89992

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.25147	0.27203	1.00712
	removal	CK (R)	-0.03078	-0.03680	-0.08133
	hold	SN (R)	-0.26584	-0.50716	-2.12010
	hold	SN (R)	-0.26816	-0.50847	-2.13135
	setup	SN (R)	0.30013	0.56408	3.84385
	setup	SN (R)	0.29514	0.57090	4.00587
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.24977	0.27154	1.00597
	removal	CK (R)	-0.03078	-0.03680	-0.08133
	hold	SN (R)	-0.26023	-0.49622	-2.06441
	hold	SN (R)	-0.26099	-0.49798	-2.07516
	setup	SN (R)	0.30196	0.55537	3.72633
	setup	SN (R)	0.28198	0.56160	3.89992

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	RN ()	0.22776	0.59204	13.33370
	min_pulse_width	RN ()	0.22997	0.59204	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.22555	0.59204	13.33370
	min_pulse_width	RN ()	0.22114	0.59204	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.08021	0.12343	2.83314
	removal	CK (R)	-0.02997	-0.08937	-0.46518
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.07923	0.12265	2.71740
	removal	CK (R)	-0.03213	-0.08959	-0.46614

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.08021	0.12343	2.83314
	removal	CK (R)	-0.02997	-0.08937	-0.46518
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.07923	0.12265	2.71740
	removal	CK (R)	-0.03213	-0.08959	-0.46614

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	SN ()	0.26309	0.59204	13.33370
	min_pulse_width	SN ()	0.26309	0.59204	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.26309	0.59204	13.33370
	min_pulse_width	SN ()	0.24763	0.59204	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_18T_ms__dffsr_1	min_pulse_width	CK ()	0.22114	0.59204	13.33370
	min_pulse_width	CK ()	0.26529	0.59204	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.21452	0.59204	13.33370
	min_pulse_width	CK ()	0.26088	0.59204	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_18T_ms__dffsr_1	min_pulse_width	CK ()	0.45295	0.59204	13.33370
	min_pulse_width	CK ()	0.23439	0.59204	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.45075	0.59204	13.33370
	min_pulse_width	CK ()	0.23439	0.59204	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01591	0.01434	0.00893
	RN	0.02916	0.02796	0.01744
	SN	-0.00167	-0.09089	-1.30683
	SN	0.03265	0.03115	0.02087
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01455	0.01287	0.01058
	RN	0.02779	0.02647	0.01920
	SN	-0.00167	-0.07512	-0.95117
	SN	0.03127	0.02969	0.02261

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01700	0.01570	0.00679
	RN	-0.00167	-0.09089	-1.30683
	RN	0.03430	0.03291	0.02532
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01563	0.01453	0.01157
	RN	-0.00167	-0.07512	-0.95116
	RN	0.03292	0.03174	0.03008

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01697	0.01567	0.00641
	RN	-0.00167	-0.09121	-1.31422
	RN	0.03426	0.03288	0.02489
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01560	0.01450	0.01118
	RN	-0.00167	-0.07537	-0.95574
	RN	0.03287	0.03165	0.02970

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01586	0.01429	0.00860
	RN	0.02911	0.02789	0.01742
	SN	-0.00167	-0.09121	-1.31452
	SN	0.03260	0.03110	0.02040
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01450	0.01282	0.01037
	RN	0.02775	0.02643	0.01898
	SN	-0.00167	-0.07537	-0.95637
	SN	0.03123	0.02963	0.02238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00442	-0.00449	-0.00449
	(!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)	0.01984	0.01902	0.02663
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00798	0.00720	0.01498
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00796	0.00718	0.01501
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00802	0.00724	0.01503
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00442	-0.00449	-0.00449
	(!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)	0.01984	0.01902	0.02663
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00798	0.00720	0.01498
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00796	0.00718	0.01502
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00802	0.00724	0.01503

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00451	0.00453	0.00449
	(!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)	0.03038	0.02996	0.03834
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01301	0.01280	0.02149
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01325	0.01290	0.02152
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01297	0.01275	0.02144
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00451	0.00453	0.00449
	(!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)	0.03037	0.02996	0.03833
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01301	0.01279	0.02148
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01324	0.01289	0.02151
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01296	0.01274	0.02143

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.00404	0.00344	0.01788
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01606	0.01514	0.02941
sky130_osu_sc_18T_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)	0.00404	0.00345	0.01789
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01606	0.01514	0.02941

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.01217	0.01255	0.02965
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02629	0.02597	0.04277
sky130_osu_sc_18T_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)	0.01216	0.01254	0.02964
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02628	0.02596	0.04276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	-0.00997	-0.01003	-0.01009
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00905	-0.01030	-0.01034
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00934	-0.00999	-0.00998
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00709	0.00642	0.01489
sky130_osu_sc_18T_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)	-0.00997	-0.01003	-0.01009
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00903	-0.01028	-0.01032
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00934	-0.00999	-0.00998
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00710	0.00643	0.01490

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_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)	0.01009	0.01028	0.01014
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01032	0.01040	0.01038
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00997	0.01009	0.01003
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02048	0.02003	0.02798
sky130_osu_sc_18T_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)	0.01009	0.01028	0.01014
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01031	0.01039	0.01037
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00997	0.01008	0.01003
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02047	0.02002	0.02797

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00168	0.01260
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00816	0.00696	0.02143
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00790	0.00674	0.02133
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00132	-0.00199	0.01217
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00569	0.00419	0.03200
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00168	0.01260
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00816	0.00696	0.02142
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00789	0.00673	0.02132
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00132	-0.00199	0.01217
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00569	0.00419	0.03200

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_18T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04436	0.04344	0.06025
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01794	0.01830	0.03514
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03127	0.03097	0.04710
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03132	0.03108	0.04701
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04288	0.04282	0.07307
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02065	0.02100	0.03727
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02399	0.02439	0.05635
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04436	0.04344	0.06025
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01794	0.01830	0.03514
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03127	0.03097	0.04710
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03132	0.03108	0.04702
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04287	0.04281	0.07313
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02065	0.02100	0.03727
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02398	0.02439	0.05634

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__dffs_1	57.87540
sky130_osu_sc_18T_ms__dffs_l	57.87540

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffs_1	0.00580	0.00964	0.01668	2.00530	1.99417
sky130_osu_sc_18T_ms__dffs_l	0.00580	0.00964	0.01668	1.49616	1.49984

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	1.13422	1.94085
sky130_osu_sc_18T_ms__dffs_l	0.00000	1.19033	1.99696

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RR)	0.34291	1.79215	18.92150
	QN->Q (FR)	0.04411	0.93276	12.18910
	SN->Q (FR)	0.24832	1.76936	18.94080
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.34305	1.96046	19.23860
	QN->Q (FR)	0.04522	0.96909	11.81670
	SN->Q (FR)	0.24752	1.92824	19.20990

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RF)	0.53101	2.08773	20.33030
	QN->Q (RF)	0.04294	0.93679	12.20090
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.52576	2.25400	20.58260
	QN->Q (RF)	0.04543	0.99291	12.14230

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RR)	0.46605	1.20566	8.30791
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.45455	1.23477	8.17227

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RF)	0.28531	0.95743	7.54817
	SN->QN (FF)	0.19062	0.93555	7.56224
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.28081	1.02232	7.82375
	SN->QN (FF)	0.18499	0.99062	7.79400

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.09255	-0.11263	-0.23238
	setup	CK (R)	0.24563	0.26995	0.92782
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09044	-0.11044	-0.23015
	setup	CK (R)	0.24571	0.27417	0.93274

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.18177	-0.44615	-2.31125
	setup	CK (R)	0.25566	0.46507	2.34203
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.18321	-0.44590	-2.31066
	setup	CK (R)	0.25621	0.46507	2.34197

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.09255	-0.11263	-0.23238
	setup	CK (R)	0.24563	0.26995	0.92782
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.09044	-0.11044	-0.23015
	setup	CK (R)	0.24571	0.27417	0.93274

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.18177	-0.44615	-2.31125
	setup	CK (R)	0.25566	0.46507	2.34203
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.18321	-0.44590	-2.31066
	setup	CK (R)	0.25621	0.46507	2.34197

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.08524	0.12701	1.80716
	removal	CK (R)	-0.03186	-0.08702	-0.52322
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.08597	0.12675	1.70203
	removal	CK (R)	-0.03404	-0.08721	-0.52294

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.08524	0.12701	1.80716
	removal	CK (R)	-0.03186	-0.08702	-0.52322
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.08597	0.12675	1.70203
	removal	CK (R)	-0.03404	-0.08721	-0.52294

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	SN ()	0.15711	0.59204	13.33370
	min_pulse_width	SN ()	0.15932	0.59204	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.15711	0.59204	13.33370
	min_pulse_width	SN ()	0.15270	0.59204	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_18T_ms__dffs_1	min_pulse_width	CK ()	0.15490	0.59204	13.33370
	min_pulse_width	CK ()	0.26529	0.59204	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.14828	0.59204	13.33370
	min_pulse_width	CK ()	0.25646	0.59204	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_18T_ms__dffs_1	min_pulse_width	CK ()	0.33815	0.59204	13.33370
	min_pulse_width	CK ()	0.22776	0.59204	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.33815	0.59204	13.33370
	min_pulse_width	CK ()	0.22776	0.59204	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01268	0.01034	-0.00157
	SN	-0.00167	-0.08991	-1.28339
	SN	0.02744	0.02520	0.00737
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01120	0.00948	0.00738
	SN	-0.00167	-0.07542	-0.95754
	SN	0.02594	0.02436	0.01900

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01440	0.01283	0.00157
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01292	0.01180	0.00900

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01439	0.01284	0.00152
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01291	0.01178	0.00879

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01264	0.01032	-0.00152
	SN	-0.00167	-0.08961	-1.27615
	SN	0.02739	0.02517	0.00785
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01116	0.00947	0.00706
	SN	-0.00167	-0.07553	-0.95983
	SN	0.02590	0.02432	0.01885

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00446	-0.00453	-0.00454
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01464	0.01375	0.02178
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00682	0.00601	0.01393
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00446	-0.00453	-0.00454
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01464	0.01375	0.02178
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00682	0.00601	0.01393

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00456	0.00457	0.00454
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02557	0.02512	0.03387
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01252	0.01226	0.02115
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00456	0.00457	0.00454
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02557	0.02512	0.03387
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01252	0.01226	0.02115

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00730	-0.00734	-0.00734
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00551	0.00495	0.01306
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00730	-0.00734	-0.00734
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00551	0.00497	0.01306

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00738	0.00745	0.00738
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01404	0.01371	0.02338
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00738	0.00745	0.00738
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01404	0.01372	0.02337

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00099	-0.00171	0.01260
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00143	-0.00210	0.01208
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00447	0.00305	0.03130
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00099	-0.00170	0.01260
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00143	-0.00211	0.01208
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00447	0.00305	0.03130

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03906	0.03817	0.05532
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01790	0.01820	0.03511
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03800	0.03800	0.06852
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02071	0.02107	0.03735
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02340	0.02396	0.05617
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03906	0.03817	0.05532
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01790	0.01819	0.03511
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03800	0.03800	0.06852
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02071	0.02107	0.03735
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02340	0.02396	0.05617

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__dff_1	48.35160
sky130_osu_sc_18T_ms__dff_l	48.35160

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_18T_ms__dff_1	0.00596	0.01667	2.04798	2.05773
sky130_osu_sc_18T_ms__dff_l	0.00596	0.01667	1.47255	1.47520

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.93616	1.15639
sky130_osu_sc_18T_ms__dff_l	0.00000	0.99227	1.21250

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RR)	0.31759	1.74165	18.65180
	QN->Q (FR)	0.04220	0.91436	11.99820
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.32616	1.94064	19.03540
	QN->Q (FR)	0.04598	0.97668	11.87150

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RF)	0.43203	1.94480	19.97920
	QN->Q (RF)	0.03979	0.89207	11.65570
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.44093	2.15296	20.33440
	QN->Q (RF)	0.04551	0.98864	12.02810

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RR)	0.37462	1.09046	8.24278
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.37399	1.13818	8.05450

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RF)	0.26319	0.92575	7.45766
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.26461	1.00442	7.71980

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.08910	-0.11304	-0.25757
	setup	CK (R)	0.21950	0.24317	0.94960
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.09053	-0.11331	-0.26053
	setup	CK (R)	0.21942	0.24225	0.94500

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.16492	-0.44677	-2.33183
	setup	CK (R)	0.19872	0.46340	2.36246
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.16617	-0.44621	-2.33364
	setup	CK (R)	0.19872	0.46340	2.36246

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	min_pulse_width	CK ()	0.14828	0.59204	13.33370
	min_pulse_width	CK ()	0.23439	0.59204	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.14607	0.59204	13.33370
	min_pulse_width	CK ()	0.22997	0.59204	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_18T_ms__dff_1	**min_pulse_width**	**CK ()**	0.31166	0.59204	13.33370
	min_pulse_width	**CK ()**	0.15932	0.59204	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.30945	0.59204	13.33370
	min_pulse_width	**CK ()**	0.15932	0.59204	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01340	0.01176	0.00681
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01202	0.01031	0.00846

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01475	0.01341	0.00499
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01339	0.01215	0.00837

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01474	0.01339	0.00485
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01338	0.01214	0.00813

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01336	0.01171	0.00668
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01199	0.01028	0.00827

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00370	-0.00442	-0.00451
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01407	0.01319	0.02153
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00370	-0.00442	-0.00451
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01407	0.01320	0.02154

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00449	0.00456	0.00452
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02641	0.02591	0.03486
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00449	0.00456	0.00452
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02641	0.02592	0.03487

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00100	-0.00171	0.01261
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00142	-0.00211	0.01211
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00100	-0.00171	0.01261
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00142	-0.00211	0.01211

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01784	0.01814	0.03506
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03853	0.03764	0.05487
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03863	0.03864	0.06952
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02062	0.02096	0.03726
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01784	0.01813	0.03506
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03854	0.03765	0.05488
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03864	0.03864	0.06953
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02062	0.02096	0.03727

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__inv_1	6.59340
sky130_osu_sc_18T_ms__inv_10	32.96700
sky130_osu_sc_18T_ms__inv_2	9.52380
sky130_osu_sc_18T_ms__inv_3	12.45420
sky130_osu_sc_18T_ms__inv_4	15.38460
sky130_osu_sc_18T_ms__inv_6	21.24540
sky130_osu_sc_18T_ms__inv_8	27.10620
sky130_osu_sc_18T_ms__inv_l	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__inv_1	0.00584	1.96836
sky130_osu_sc_18T_ms__inv_10	0.05531	17.86610
sky130_osu_sc_18T_ms__inv_2	0.01125	3.83262
sky130_osu_sc_18T_ms__inv_3	0.01679	5.54815
sky130_osu_sc_18T_ms__inv_4	0.02224	7.43202
sky130_osu_sc_18T_ms__inv_6	0.03335	10.95456
sky130_osu_sc_18T_ms__inv_8	0.04434	14.49378
sky130_osu_sc_18T_ms__inv_l	0.00441	1.42520

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.14445	0.28224
sky130_osu_sc_18T_ms__inv_10	0.00000	1.40886	2.77028
sky130_osu_sc_18T_ms__inv_2	0.00000	0.28177	0.55406
sky130_osu_sc_18T_ms__inv_3	0.00000	0.42622	0.83630
sky130_osu_sc_18T_ms__inv_4	0.00000	0.56354	1.10811
sky130_osu_sc_18T_ms__inv_6	0.00000	0.84532	1.66217
sky130_osu_sc_18T_ms__inv_8	0.00000	1.12709	2.21623
sky130_osu_sc_18T_ms__inv_l	0.00000	0.17251	0.34084

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (FR)**	0.04040	0.85227	11.05360
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.05694	0.58439	11.01820
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.03316	0.73328	10.93410
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.03642	0.68925	10.95310
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.03743	0.65582	10.92900
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.04200	0.61543	10.92330
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.04900	0.59387	10.95380
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.04312	0.89859	10.86640

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (RF)**	0.03647	0.81178	10.49910
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.05595	0.55893	10.28480
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.03033	0.70538	10.37030
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.03297	0.66500	10.40040
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.03312	0.63057	10.37790
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.04103	0.59476	10.35200
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.04841	0.57440	10.35120
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.04149	0.89518	10.84690

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00675	0.00700	0.00900
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05881	0.06396	0.08517
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01217	0.01304	0.01700
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01859	0.01975	0.02594
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02403	0.02569	0.03393
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03562	0.03875	0.05098
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04721	0.05266	0.06786
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00513	0.00475	0.00654

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00154	-0.00141	-0.00058
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.02513	-0.02273	-0.01124
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00479	-0.00438	-0.00250
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00643	-0.00599	-0.00288
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00980	-0.00872	-0.00481
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.01506	-0.01309	-0.00705
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.02034	-0.01857	-0.00922
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00107	-0.00100	-0.00036

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__mux2_1	18.31500

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_18T_ms__mux2_1	0.45082	0.45119	0.01184	0.46602

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.29502	0.29553

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (RR)	-	0.02610	0.41890	4.00416
	A1->Y (RR)	-	0.02777	0.42057	4.00591
	S0->Y (RR)	(!A0 * A1)	0.07781	0.46791	2.53376
	S0->Y (FR)	(A0 * !A1)	0.05640	0.50914	3.80618

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (FF)	-	0.02283	0.41004	3.91330
	A1->Y (FF)	-	0.02176	0.40736	3.90625
	S0->Y (FF)	(!A0 * A1)	0.09452	0.46880	2.23555
	S0->Y (RF)	(A0 * !A1)	0.04230	0.49697	3.95071

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00683	-0.00681	-0.00683
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00490	-0.00490	-0.00491
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00766	0.00819	0.02603
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00487	-0.00528	0.01038

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00683	0.00684	0.00683
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00490	0.00491	0.00491
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00138	0.00106	0.01722
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01791	0.01826	0.03557

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00175	-0.00175	-0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00176	0.00175	0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00207	-0.00207	-0.00207

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00207	0.00207	0.00207

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00178	-0.00214	0.01379
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00173	-0.00215	0.01395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.01351	0.01396	0.03123
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01205	0.01260	0.03033

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nand2_1	9.52380
sky130_osu_sc_18T_ms__nand2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00585	0.00582	1.38789
sky130_osu_sc_18T_ms__nand2_l	0.00442	0.00440	0.93299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.14315	0.55406
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.17174	0.67447

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (FR)	0.04157	0.76750	9.14534
	B->Y (FR)	0.04865	0.76892	9.08555
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.04405	0.78825	8.66685
	B->Y (FR)	0.05160	0.79413	8.64586

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (RF)	0.05691	0.96126	11.44350
	B->Y (RF)	0.06468	0.93796	10.97820
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.06679	1.06941	11.48640
	B->Y (RF)	0.07458	1.04551	11.00760

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00718	0.00707	0.00978
	B	0.00000	0.00000	0.00000
	B	0.00894	0.00875	0.01151
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00541	0.00532	0.00712
	B	0.00000	0.00000	0.00000
	B	0.00667	0.00670	0.00832

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00107	-0.00109	-0.00015
	B	0.00000	0.00000	0.00000
	B	-0.00100	-0.00120	-0.00044
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00079	-0.00085	-0.00006
	B	0.00000	0.00000	0.00000
	B	-0.00074	-0.00088	-0.00030

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00497	-0.00500	-0.00501
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00357	-0.00359	-0.00359

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00500	0.00506	0.00502
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00359	0.00363	0.00360

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00469	-0.00471	-0.00469
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00336	-0.00338	-0.00336

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00473	0.00475	0.00470
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00339	0.00340	0.00337

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nor2_1	9.52380
sky130_osu_sc_18T_ms__nor2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nor2_1	0.00584	0.00616	1.02459
sky130_osu_sc_18T_ms__nor2_l	0.00434	0.00468	0.72639

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.10971	0.28224
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.13867	0.34084

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (FR)	0.08673	1.00293	10.63460
	B->Y (FR)	0.06523	0.98504	10.75080
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.09235	1.07742	10.41970
	B->Y (FR)	0.07476	1.07944	10.74890

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (RF)	0.05081	0.69115	7.63510
	B->Y (RF)	0.03894	0.67772	7.60964
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.05551	0.74775	7.76920
	B->Y (RF)	0.04411	0.73257	7.74876

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00978	0.00971	0.01094
	B	0.00000	0.00000	0.00000
	B	0.00732	0.00736	0.01041
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00702	0.00697	0.00781
	B	0.00000	0.00000	0.00000
	B	0.00548	0.00548	0.00739

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00113	0.00091	0.00205
	B	0.00000	0.00000	0.00000
	B	-0.00120	-0.00111	0.00004
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00075	0.00058	0.00152
	B	0.00000	0.00000	0.00000
	B	-0.00079	-0.00071	0.00016

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00373	-0.00446	-0.00453
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00266	-0.00311	-0.00316

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00449	0.00449	0.00453
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00315	0.00318	0.00317

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00214	-0.00217	-0.00215
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00158	-0.00160	-0.00158

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00226	0.00228	0.00219
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00166	0.00168	0.00161

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__oai21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__oai21_l	0.00590	0.00596	0.00489	1.01310

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.18637	0.62308

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (FR)	0.08760	1.00786	10.74620
	A1->Y (FR)	0.11358	1.03238	10.63410
	B0->Y (FR)	0.05420	0.81304	8.97316

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (RF)	0.08007	0.88977	9.42666
	A1->Y (RF)	0.10059	0.89198	9.21150
	B0->Y (RF)	0.06155	0.90946	10.01470

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00987	0.00987	0.01248
	A1	0.00000	0.00000	0.00000
	A1	0.01236	0.01222	0.01333
	B0	0.00843	0.00852	0.01058

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00024	0.00000	0.00081
	A1	0.00000	0.00000	0.00000
	A1	0.00251	0.00208	0.00285
	B0	0.00340	0.00334	0.00425

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00214	-0.00217	-0.00215
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00447	-0.00453	-0.00451
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00461	-0.00463	-0.00461

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00227	0.00229	0.00220
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00448	0.00453	0.00451
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00461	0.00466	0.00462

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00367	-0.00439	-0.00447
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00443	-0.00450	-0.00449
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00456	-0.00459	-0.00457

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00444	0.00449	0.00448
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00446	0.00450	0.00449
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00457	0.00463	0.00459

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00359	-0.00361	-0.00369

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00369	0.00376	0.00370

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__oai22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__oai22_1	0.00574	0.00601	0.00615	0.00602	1.01216

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.16042	0.55428

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (FR)	0.12398	1.04003	10.60500
	A1->Y (FR)	0.10227	1.01757	10.72310
	B0->Y (FR)	0.07349	0.98872	10.70710
	B1->Y (FR)	0.09588	1.01122	10.59150

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (RF)	0.14388	0.97642	9.62854
	A1->Y (RF)	0.11276	0.93233	9.49193
	B0->Y (RF)	0.09563	0.95282	10.05170
	B1->Y (RF)	0.12859	1.00491	10.28910

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.01615	0.01602	0.01710
	A1	0.01366	0.01364	0.01620
	B0	0.01029	0.01041	0.01298
	B1	0.01288	0.01280	0.01391

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00426	0.00385	0.00455
	A1	0.00216	0.00184	0.00254
	B0	0.00213	0.00197	0.00294
	B1	0.00426	0.00394	0.00492

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00372	-0.00446	-0.00453
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00372	-0.00446	-0.00453
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00444	-0.00452	-0.00450
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00457	-0.00459	-0.00458

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00450	0.00450	0.00453
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00450	0.00450	0.00454
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00447	0.00452	0.00450
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00458	0.00463	0.00460

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00213	-0.00216	-0.00214
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00213	-0.00216	-0.00214
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00443	-0.00447	-0.00447
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00456	-0.00459	-0.00457

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00225	0.00227	0.00218
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00225	0.00227	0.00218
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00445	0.00447	0.00447
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00457	0.00462	0.00458

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00212	-0.00216	-0.00213
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00212	-0.00216	-0.00213
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00484	-0.00490	-0.00487
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00483	-0.00487	-0.00497

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00224	0.00226	0.00217
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00224	0.00225	0.00217
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00485	0.00490	0.00487
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00497	0.00506	0.00499

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00367	-0.00440	-0.00448
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00367	-0.00440	-0.00448
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00489	-0.00497	-0.00495
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00490	-0.00494	-0.00502

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00445	0.00450	0.00448
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00445	0.00450	0.00448
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00494	0.00498	0.00495
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00502	0.00508	0.00505

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__or2_1	12.45420
sky130_osu_sc_18T_ms__or2_2	15.38460
sky130_osu_sc_18T_ms__or2_4	21.24540
sky130_osu_sc_18T_ms__or2_8	32.96700
sky130_osu_sc_18T_ms__or2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__or2_1	0.00617	0.00598	2.01124
sky130_osu_sc_18T_ms__or2_2	0.00617	0.00598	3.93537
sky130_osu_sc_18T_ms__or2_4	0.00618	0.00598	7.58634
sky130_osu_sc_18T_ms__or2_8	0.00617	0.00599	14.61211
sky130_osu_sc_18T_ms__or2_l	0.00474	0.00450	1.45728

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.18537	0.29173
sky130_osu_sc_18T_ms__or2_2	0.00000	0.25545	0.56354
sky130_osu_sc_18T_ms__or2_4	0.00000	0.40108	1.11760
sky130_osu_sc_18T_ms__or2_8	0.00000	0.69233	2.22572
sky130_osu_sc_18T_ms__or2_l	0.00000	0.22710	0.34621

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (RR)	0.10819	0.82678	7.93725
	B->Y (RR)	0.09273	0.77451	7.78167
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.11968	0.76364	8.08007
	B->Y (RR)	0.10386	0.72072	7.93005
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.15494	0.77425	8.43850
	B->Y (RR)	0.13862	0.73966	8.30203
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.22087	0.84809	9.01581
	B->Y (RR)	0.20416	0.82392	8.90280
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.11702	0.89279	7.84593
	B->Y (RR)	0.10141	0.84452	7.68488

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (FF)	0.17526	0.85512	7.30885
	B->Y (FF)	0.14752	0.81048	7.12119
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.21015	0.83603	7.49790
	B->Y (FF)	0.18244	0.80530	7.31850
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.29694	0.90794	7.94721
	B->Y (FF)	0.26930	0.88751	7.78427
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.47306	1.09648	8.53282
	B->Y (FF)	0.44552	1.07374	8.41318
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.18765	0.94128	7.58353
	B->Y (FF)	0.16185	0.91050	7.46304

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00762	0.00708	0.01597
	B	0.00000	0.00000	0.00000
	B	0.00538	0.00499	0.01731
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01296	0.01282	0.02167
	B	0.00000	0.00000	0.00000
	B	0.01073	0.01094	0.02254
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02459	0.02523	0.03365
	B	0.00000	0.00000	0.00000
	B	0.02234	0.02345	0.03370
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04835	0.04960	0.05964
	B	0.00000	0.00000	0.00000
	B	0.04609	0.04810	0.05937
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00557	0.00512	0.01172
	B	0.00000	0.00000	0.00000
	B	0.00408	0.00378	0.01232

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01549	0.01553	0.02406
	B	0.00000	0.00000	0.00000
	B	0.01271	0.01356	0.02905
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01875	0.01956	0.02780
	B	0.00000	0.00000	0.00000
	B	0.01596	0.01742	0.03228
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02740	0.02920	0.03718
	B	0.00000	0.00000	0.00000
	B	0.02450	0.02668	0.04115
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04684	0.04738	0.05641
	B	0.00000	0.00000	0.00000
	B	0.04375	0.04527	0.05964
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01155	0.01149	0.01752
	B	0.00000	0.00000	0.00000
	B	0.00967	0.01015	0.02048

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00448	-0.00455
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00448	-0.00455
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00448	-0.00455
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00448	-0.00455
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00267	-0.00313	-0.00318

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00452	0.00457	0.00455
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00452	0.00459	0.00455
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00452	0.00459	0.00455
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00452	0.00459	0.00455
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00316	0.00319	0.00318

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00215	-0.00217	-0.00216
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00215	-0.00218	-0.00216
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00215	-0.00218	-0.00216
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00215	-0.00218	-0.00216
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00160	-0.00162	-0.00161

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00229	0.00230	0.00220
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00229	0.00230	0.00220
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00229	0.00230	0.00220
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00229	0.00230	0.00220
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00170	0.00171	0.00163

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tbufi_1	12.45420
sky130_osu_sc_18T_ms__tbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tbufi_1	0.00615	0.00770	1.02564
sky130_osu_sc_18T_ms__tbufi_l	0.00469	0.00589	0.72241

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.15062	0.56448
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.17666	0.68168

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (FR)	0.06241	0.97957	10.75080
	OE->Y (FR)	0.06655	0.38950	4.68897
	OE->Y (RR)	0.12217	0.92904	7.81247
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.07198	1.07338	10.71990
	OE->Y (FR)	0.06726	0.38921	4.68872
	OE->Y (RR)	0.13090	1.02806	7.81786

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (RF)	0.05570	0.86623	9.56471
	OE->Y (FF)	0.06768	0.38949	4.68898
	OE->Y (RF)	0.05174	0.82843	9.07301
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.06631	0.97163	9.85322
	OE->Y (FF)	0.06832	0.38922	4.68872
	OE->Y (RF)	0.06239	0.93597	9.35220

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00689	0.00705	0.00969
	OE	0.00000	0.00000	0.00000
	OE	0.00700	0.00672	0.02147
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00519	0.00525	0.00692
	OE	0.00000	0.00000	0.00000
	OE	0.00491	0.00470	0.01495

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00121	-0.00114	-0.00009
	OE	0.00000	0.00000	0.00000
	OE	0.00465	0.00435	0.02060
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00079	-0.00073	0.00005
	OE	0.00000	0.00000	0.00000
	OE	0.00321	0.00299	0.01395

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00345	-0.00345	-0.00346
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00300	-0.00306	-0.00301
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00261	-0.00265	-0.00262
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00232	-0.00235	-0.00233

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00345	0.00345	0.00346
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00309	0.00312	0.00306
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00261	0.00265	0.00262
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00238	0.00240	0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00281	0.00261	0.01898
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00243	0.00220	0.01852
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00190	0.00171	0.01278
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00164	0.00143	0.01247

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00800	0.00818	0.02563
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00796	0.00826	0.02576
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00617	0.00617	0.01787
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00616	0.00624	0.01797

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tnbufi_1	12.45420
sky130_osu_sc_18T_ms__tnbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tnbufi_1	0.00615	0.00981	1.04783
sky130_osu_sc_18T_ms__tnbufi_l	0.00469	0.00723	0.72173

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.24248	0.28977
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.28889	0.34597

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (FR)	0.06300	0.98790	10.89920
	OE->Y (RR)	0.04387	0.39079	4.69035
	OE->Y (FR)	0.08092	1.00587	10.77930
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.07266	1.07301	10.71350
	OE->Y (RR)	0.04691	0.39106	4.69063
	OE->Y (FR)	0.08671	1.07095	10.37730

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (RF)	0.05493	0.87229	9.67981
	OE->Y (RF)	0.04364	0.39079	4.69044
	OE->Y (FF)	0.08748	0.71989	6.00684
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.06534	0.97093	9.84751
	OE->Y (RF)	0.04670	0.39106	4.69064
	OE->Y (FF)	0.09898	0.82388	6.12707

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00704	0.00719	0.00978
	OE	0.00000	0.00000	0.00000
	OE	0.01717	0.01807	0.03654
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00534	0.00539	0.00707
	OE	0.00000	0.00000	0.00000
	OE	0.01258	0.01307	0.02543

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00142	-0.00132	-0.00029
	OE	0.00000	0.00000	0.00000
	OE	0.01506	0.01593	0.03321
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00099	-0.00092	-0.00014
	OE	0.00000	0.00000	0.00000
	OE	0.01106	0.01155	0.02310

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00300	-0.00300	-0.00301
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00259	-0.00264	-0.00260
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00219	-0.00223	-0.00220
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00192	-0.00195	-0.00193

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00300	0.00300	0.00301
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00267	0.00270	0.00265
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00219	0.00223	0.00220
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00198	0.00200	0.00196

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00530	-0.00610	0.01103
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00537	-0.00608	0.01106
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00373	-0.00427	0.00725
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00377	-0.00426	0.00728

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01295	0.01386	0.03218
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01270	0.01363	0.03194
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00955	0.01006	0.02234
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00939	0.00989	0.02217

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__xnor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xnor2_l	0.01218	0.01120	1.05976

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.49697	0.84352

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (RR)	B	0.15402	0.99063	8.13327
	A->Y (FR)	!B	0.08277	1.01423	10.95860
	B->Y (RR)	A	0.12281	0.95816	8.10643
	B->Y (FR)	!A	0.11127	1.03757	10.85410

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (FF)	B	0.16287	0.87314	6.54881
	A->Y (RF)	!B	0.08039	0.87710	9.44782
	B->Y (FF)	A	0.13551	0.84749	6.53524
	B->Y (RF)	!A	0.10326	0.90563	9.46907

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00685	0.00636	0.02038
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01683	0.01724	0.03723
	B	A	0.00000	0.00000	0.00000
	B	A	0.00204	0.00191	0.01785
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01876	0.01917	0.03778

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.02096	0.02068	0.03774
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00441	0.00383	0.02033
	B	A	0.00000	0.00000	0.00000
	B	A	0.01877	0.01955	0.03729
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00585	0.00510	0.02155

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_18T_ms__xor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xor2_l	0.01216	0.01125	1.04718

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.49697	0.81905

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (RR)	!B	0.14532	0.97088	8.05802
	A->Y (FR)	B	0.10134	1.02386	10.81970
	B->Y (RR)	!A	0.12561	0.95832	8.06142
	B->Y (FR)	A	0.11028	1.03447	10.81500

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (FF)	!B	0.13687	0.82959	6.26808
	A->Y (RF)	B	0.08473	0.91087	9.70667
	B->Y (FF)	!A	0.12867	0.82529	6.29990
	B->Y (RF)	A	0.09673	0.88370	9.23061

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01963	0.02010	0.03908
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00330	0.00223	0.01780
	B	A	0.00000	0.00000	0.00000
	B	A	0.02033	0.02088	0.03969
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00177	0.00153	0.01752

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00403	0.00317	0.02011
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02096	0.02159	0.03835
	B	A	0.00000	0.00000	0.00000
	B	A	0.00405	0.00324	0.01985
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01907	0.02008	0.03776

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__ant	6.59340
sky130_osu_sc_18T_ms__tiehi	6.59340
sky130_osu_sc_18T_ms__tielo	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_18T_ms__ant	0.57950
sky130_osu_sc_18T_ms__tiehi	0.00000
sky130_osu_sc_18T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__ant	0.00000	207139.00000	414277.00000
sky130_osu_sc_18T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_18T_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_18T_ms__ant	0.00000	0.00000	0.00000
	-0.00249	0.06163	0.75128

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__ant	0.00000	0.00000	0.00000
	3.60461	3.39018	0.91278