sky130_osu_sc_18T_ms_ss_1P44_-40C.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_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.02002	0.02006	0.01560	0.99413	0.42189	0.97451
sky130_osu_sc_18T_ms__addf_l	0.02001	0.02006	0.01560	0.59694	0.42431	0.59616

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.00045	0.00050
sky130_osu_sc_18T_ms__addf_l	0.00000	0.00041	0.00050

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)	0.28957	2.34214	23.36900
	B->CO (RR)	0.26665	2.24060	22.51310
	CI->CO (RR)	0.27784	2.35020	23.66950
	CON->CO (FR)	0.06520	1.16188	12.91800
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.30292	2.20464	18.73580
	B->CO (RR)	0.28064	2.12670	18.26230
	CI->CO (RR)	0.29112	2.21526	19.06840
	CON->CO (FR)	0.08503	1.31434	12.96970

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)	0.60030	3.98091	38.46580
	B->CO (FF)	0.55414	3.84655	37.40110
	CI->CO (FF)	0.54179	3.86688	37.91020
	CON->CO (RF)	0.03862	0.75148	8.53116
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.59084	3.35589	27.15870
	B->CO (FF)	0.54546	3.24969	26.49820
	CI->CO (FF)	0.53221	3.24106	26.61840
	CON->CO (RF)	0.04291	0.76853	8.10463

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)	0.41732	1.79558	13.54740
	B->CON (FR)	0.37717	1.71856	13.26420
	CI->CON (FR)	0.35887	1.68063	13.02930
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.39629	1.77735	13.56740
	B->CON (FR)	0.35720	1.70149	13.27700
	CI->CON (FR)	0.33780	1.66237	13.04900

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)	0.14343	0.82570	7.14423
	B->CON (RF)	0.13195	0.80496	7.19041
	CI->CON (RF)	0.13155	0.83713	7.49351
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.13783	0.82054	7.15233
	B->CON (RF)	0.12692	0.80094	7.19945
	CI->CON (RF)	0.12594	0.83262	7.50307

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)	0.81782	4.06908	33.93960
	B->S (-R)	0.79975	4.00475	33.42530
	CI->S (-R)	0.75519	3.94816	33.35780
	CON->S (RR)	0.17169	1.17624	9.65274
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.78917	3.61647	26.29450
	B->S (-R)	0.77227	3.56811	26.00700
	CI->S (-R)	0.72640	3.49436	25.73950
	CON->S (RR)	0.18379	1.30657	9.54818

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)	0.54548	2.23553	17.56740
	B->S (-F)	0.57884	2.16340	16.97710
	CI->S (-F)	0.53289	2.23587	17.85260
	CON->S (FF)	0.24879	1.06961	8.12636
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.51545	1.96103	13.60990
	B->S (-F)	0.54856	1.90495	13.29110
	CI->S (-F)	0.50243	1.96426	13.93300
	CON->S (FF)	0.23846	1.06854	7.62766

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	0.00299	0.00290	0.00280
	B	0.00363	0.00368	0.00361
	CI	0.00390	0.00396	0.00391
sky130_osu_sc_18T_ms__addf_l	A	0.00232	0.00217	0.00205
	B	0.00296	0.00293	0.00281
	CI	0.00323	0.00324	0.00316

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01132	0.01130	0.01125
	B	0.01113	0.01127	0.01118
	CI	0.00973	0.01002	0.00997
sky130_osu_sc_18T_ms__addf_l	A	0.01066	0.01061	0.01055
	B	0.01046	0.01055	0.01047
	CI	0.00905	0.00930	0.00921

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01131	0.01128	0.01122
	B	0.01112	0.01122	0.01116
	CI	0.00972	0.00994	0.00979
sky130_osu_sc_18T_ms__addf_l	A	0.01066	0.01060	0.01053
	B	0.01046	0.01054	0.01042
	CI	0.00905	0.00926	0.00909

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00295	0.00287	0.00271
	B	0.00359	0.00362	0.00341
	CI	0.00389	0.00396	0.00384
sky130_osu_sc_18T_ms__addf_l	A	0.00229	0.00216	0.00196
	B	0.00293	0.00291	0.00267
	CI	0.00322	0.00323	0.00310

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01132	0.01130	0.01126
	B	0.01113	0.01127	0.01118
	CI	0.00973	0.01002	0.00992
sky130_osu_sc_18T_ms__addf_l	A	0.01066	0.01062	0.01058
	B	0.01047	0.01056	0.01050
	CI	0.00906	0.00931	0.00923

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02369	0.02385	0.02374
	B	0.02144	0.02125	0.02093
	CI	0.01894	0.01903	0.01892
sky130_osu_sc_18T_ms__addf_l	A	0.02279	0.02281	0.02268
	B	0.02057	0.02015	0.01991
	CI	0.01807	0.01806	0.01794

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00992	0.01073	0.98677	0.44987	0.99223
sky130_osu_sc_18T_ms__addh_l	0.00993	0.01073	0.59482	0.44880	0.59803

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__addh_1	0.00000	0.00039	0.00046
sky130_osu_sc_18T_ms__addh_l	0.00000	0.00036	0.00043

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)	0.20785	1.20003	9.53131
	B->CO (RR)	0.21335	1.19777	9.70441
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.21063	1.31913	9.40957
	B->CO (RR)	0.21634	1.32023	9.59904

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)	0.21405	1.01076	8.14347
	B->CO (FF)	0.22622	1.02386	8.19091
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.21005	1.05684	8.03207
	B->CO (FF)	0.22187	1.07005	8.08168

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	0.28821	1.02845	5.84395
	A->CON (FR)	!B	0.25026	1.57207	13.07670
	B->CON (RR)	A	0.29402	1.02582	6.01434
	B->CON (FR)	!A	0.29477	1.66709	13.61420
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.25782	0.98847	5.70864
	A->CON (FR)	!B	0.22269	1.54206	13.03000
	B->CON (RR)	A	0.26349	0.98873	5.88343
	B->CON (FR)	!A	0.26712	1.63787	13.56860

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	0.28652	1.08046	7.45184
	A->CON (RF)	!B	0.09040	0.79330	7.51064
	B->CON (FF)	A	0.29487	1.11296	7.67913
	B->CON (RF)	!A	0.10109	0.78539	7.32664
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.25622	1.03845	7.24864
	A->CON (RF)	!B	0.08297	0.78490	7.49516
	B->CON (FF)	A	0.26407	1.07167	7.47746
	B->CON (RF)	!A	0.09399	0.77755	7.31142

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	0.21690	2.23161	23.12320
	A->S (FR)	B	0.41303	2.49040	22.74380
	B->S (RR)	!A	0.22530	2.16977	22.28770
	B->S (FR)	A	0.42459	2.58035	23.62530
	CON->S (FR)	-	0.07009	1.18418	13.11790
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.21687	2.09287	18.69680
	A->S (FR)	B	0.39079	2.33311	18.30680
	B->S (RR)	!A	0.22619	2.04925	18.20370
	B->S (FR)	A	0.40139	2.40297	18.86030
	CON->S (FR)	-	0.08456	1.33052	13.09980

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	0.39916	3.57188	36.29220
	A->S (RF)	B	0.38704	2.19942	18.96010
	B->S (FF)	!A	0.44355	3.67020	36.86720
	B->S (RF)	A	0.39280	2.19633	19.11730
	CON->S (RF)	-	0.03633	0.73388	8.38912
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.37909	3.04100	26.26250
	A->S (RF)	B	0.36147	1.94196	13.91190
	B->S (FF)	!A	0.42318	3.13442	26.82230
	B->S (RF)	A	0.36737	1.94136	14.09330
	CON->S (RF)	-	0.04302	0.80613	8.47810

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	0.00499	0.00479	0.00452
	B	0.00000	0.00000	0.00000
	B	0.00464	0.00446	0.00417
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00405	0.00378	0.00361
	B	0.00000	0.00000	0.00000
	B	0.00370	0.00345	0.00326

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	0.00794	0.00770	0.00725
	B	0.00000	0.00000	0.00000
	B	0.00825	0.00825	0.00782
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00698	0.00673	0.00648
	B	0.00000	0.00000	0.00000
	B	0.00730	0.00724	0.00705

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	0.00499	0.00478	0.00456
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00690	0.00686	0.00680
	B	A	0.00000	0.00000	0.00000
	B	A	0.00464	0.00445	0.00428
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00747	0.00742	0.00739
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00404	0.00379	0.00359
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00627	0.00621	0.00615
	B	A	0.00000	0.00000	0.00000
	B	A	0.00370	0.00345	0.00325
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00684	0.00678	0.00674

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	0.00794	0.00772	0.00753
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00117	0.00115	0.00100
	B	A	0.00000	0.00000	0.00000
	B	A	0.00825	0.00824	0.00812
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00188	0.00179	0.00167
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00699	0.00672	0.00649
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00036	0.00033	0.00017
	B	A	0.00000	0.00000	0.00000
	B	A	0.00730	0.00724	0.00708
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00107	0.00097	0.00084

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	0.00795	0.00772	0.00750
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00117	0.00118	0.00111
	B	A	0.00000	0.00000	0.00000
	B	A	0.00826	0.00825	0.00811
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00190	0.00182	0.00175
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00700	0.00674	0.00658
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00036	0.00034	0.00027
	B	A	0.00000	0.00000	0.00000
	B	A	0.00731	0.00725	0.00717
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00109	0.00098	0.00091

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	0.00499	0.00479	0.00457
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00690	0.00692	0.00689
	B	A	0.00000	0.00000	0.00000
	B	A	0.00464	0.00445	0.00422
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00746	0.00747	0.00745
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00404	0.00378	0.00365
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00627	0.00626	0.00622
	B	A	0.00000	0.00000	0.00000
	B	A	0.00370	0.00344	0.00333
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00684	0.00679	0.00678

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00532	0.00538	0.99021
sky130_osu_sc_18T_ms__and2_2	0.00531	0.00538	1.97209
sky130_osu_sc_18T_ms__and2_4	0.00531	0.00538	3.78729
sky130_osu_sc_18T_ms__and2_6	0.00535	0.00538	5.60299
sky130_osu_sc_18T_ms__and2_8	0.00532	0.00539	7.31632
sky130_osu_sc_18T_ms__and2_l	0.00409	0.00417	0.59683

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.00018	0.00025
sky130_osu_sc_18T_ms__and2_2	0.00000	0.00027	0.00029
sky130_osu_sc_18T_ms__and2_4	0.00000	0.00044	0.00048
sky130_osu_sc_18T_ms__and2_6	0.00000	0.00062	0.00069
sky130_osu_sc_18T_ms__and2_8	0.00000	0.00080	0.00090
sky130_osu_sc_18T_ms__and2_l	0.00000	0.00013	0.00017

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)	0.15807	1.10960	9.09080
	B->Y (RR)	0.16571	1.11728	9.31506
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.18205	1.02978	9.47212
	B->Y (RR)	0.18963	1.02942	9.65382
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.25441	1.04154	9.97876
	B->Y (RR)	0.26192	1.03264	10.07920
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.32522	1.08963	10.38070
	B->Y (RR)	0.33261	1.08021	10.43740
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.39576	1.15527	10.71890
	B->Y (RR)	0.40315	1.14541	10.76290
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.19331	1.28955	9.33776
	B->Y (RR)	0.20157	1.29503	9.54132

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)	0.15772	0.92115	7.63030
	B->Y (FF)	0.16885	0.93805	7.71134
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.19406	0.91742	7.95132
	B->Y (FF)	0.20609	0.93288	8.02535
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.28332	0.98757	8.43353
	B->Y (FF)	0.29577	1.00088	8.48418
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.37487	1.07898	8.79288
	B->Y (FF)	0.38736	1.09240	8.84288
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.46184	1.16962	9.04280
	B->Y (FF)	0.47485	1.18448	9.08101
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.19108	0.98524	7.52418
	B->Y (FF)	0.20633	1.00592	7.61851

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	0.00407	0.00364	0.00353
	B	0.00000	0.00000	0.00000
	B	0.00413	0.00371	0.00364
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00794	0.00774	0.00775
	B	0.00000	0.00000	0.00000
	B	0.00801	0.00784	0.00775
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01632	0.01649	0.02113
	B	0.00000	0.00000	0.00000
	B	0.01638	0.01668	0.01664
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02460	0.02529	0.02584
	B	0.00000	0.00000	0.00000
	B	0.02467	0.02553	0.02609
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03287	0.03355	0.03523
	B	0.00000	0.00000	0.00000
	B	0.03293	0.03388	0.03455
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00299	0.00269	0.00261
	B	0.00000	0.00000	0.00000
	B	0.00305	0.00273	0.00264

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	0.00968	0.00949	0.00936
	B	0.00000	0.00000	0.00000
	B	0.01082	0.01063	0.01052
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01220	0.01247	0.01241
	B	0.00000	0.00000	0.00000
	B	0.01336	0.01360	0.01353
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01841	0.01960	0.01977
	B	0.00000	0.00000	0.00000
	B	0.01956	0.02071	0.02080
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02469	0.02685	0.02725
	B	0.00000	0.00000	0.00000
	B	0.02583	0.02781	0.02814
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03072	0.03373	0.03459
	B	0.00000	0.00000	0.00000
	B	0.03187	0.03466	0.03534
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00744	0.00726	0.00714
	B	0.00000	0.00000	0.00000
	B	0.00828	0.00810	0.00799

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)	-0.00350	-0.00351	-0.00353
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00352	-0.00353
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00351	-0.00353
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00351	-0.00353	-0.00355
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00353	-0.00353
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00257	-0.00258	-0.00260

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)	0.00353	0.00357	0.00355
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00353	0.00357	0.00355
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00353	0.00357	0.00355
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00355	0.00359	0.00356
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00353	0.00357	0.00354
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00259	0.00265	0.00260

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)	-0.00332	-0.00334	-0.00333
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00331	-0.00334	-0.00333
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00331	-0.00334	-0.00333
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00331	-0.00334	-0.00333
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00332	-0.00334	-0.00333
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00244	-0.00245	-0.00245

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)	0.00332	0.00336	0.00334
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00331	0.00336	0.00334
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00331	0.00336	0.00334
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00331	0.00336	0.00334
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00332	0.00336	0.00334
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00244	0.00246	0.00245

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00495	0.00519	0.00505	0.43299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.00010	0.00011

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)	0.22035	1.61781	13.57040
	A1->Y (FR)	0.18894	1.54795	13.27980
	B0->Y (FR)	0.16976	1.51273	13.05660

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)	0.07436	0.73853	6.97242
	A1->Y (RF)	0.06725	0.74544	7.19128
	B0->Y (RF)	0.04923	0.72125	7.27276

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	0.00788	0.00778	0.00777
	A1	0.00000	0.00000	0.00000
	A1	0.00669	0.00656	0.00651
	B0	0.00655	0.00639	0.00633

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	0.00116	0.00096	0.00082
	A1	0.00000	0.00000	0.00000
	A1	0.00117	0.00094	0.00082
	B0	-0.00079	-0.00081	-0.00089

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)	-0.00299	-0.00308	-0.00306
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00313	-0.00315	-0.00314
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00313	-0.00314	-0.00314

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)	0.00304	0.00308	0.00306
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00313	0.00316	0.00315
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00313	0.00316	0.00315

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)	-0.00295	-0.00304	-0.00302
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00309	-0.00312	-0.00310
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00333	-0.00336	-0.00337

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)	0.00300	0.00304	0.00302
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00309	0.00316	0.00311
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00336	0.00344	0.00338

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)	-0.00187	-0.00189	-0.00188

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)	0.00204	0.00206	0.00192

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00495	0.00519	0.00541	0.00515	0.42368

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.00014	0.00021

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)	0.28107	1.68920	13.60560
	A1->Y (FR)	0.25051	1.63727	13.44190
	B0->Y (FR)	0.18073	1.50950	12.87570
	B1->Y (FR)	0.21132	1.56215	13.09110

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)	0.09278	0.75521	6.94148
	A1->Y (RF)	0.08570	0.76068	7.15879
	B0->Y (RF)	0.05712	0.72779	7.11586
	B1->Y (RF)	0.06402	0.72040	6.90207

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	0.00966	0.00955	0.00955
	A1	0.00850	0.00833	0.00827
	B0	0.00704	0.00682	0.00572
	B1	0.00817	0.00797	0.00791

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00269	0.00251	0.00232
	A1	0.00271	0.00249	0.00231
	B0	-0.00048	-0.00050	-0.00058
	B1	-0.00045	-0.00047	-0.00055

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)	-0.00299	-0.00308	-0.00305
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00313	-0.00316	-0.00314
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00312	-0.00314	-0.00314
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00312	-0.00314	-0.00314

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)	0.00304	0.00310	0.00305
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00313	0.00316	0.00315
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00312	0.00316	0.00315
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00312	0.00316	0.00315

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)	-0.00295	-0.00305	-0.00302
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00309	-0.00312	-0.00310
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00333	-0.00336	-0.00337
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00333	-0.00336	-0.00337

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)	0.00301	0.00307	0.00302
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00310	0.00316	0.00311
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00336	0.00343	0.00338
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00336	0.00343	0.00338

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)	-0.00188	-0.00190	-0.00189
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00188	-0.00188	-0.00188
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00342	-0.00343	-0.00346
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00342	-0.00343	-0.00346

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)	0.00210	0.00211	0.00194
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00188	0.00189	0.00188
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00345	0.00352	0.00347
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00345	0.00345	0.00347

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)	-0.00189	-0.00191	-0.00190
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00188	-0.00190	-0.00189
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00318	-0.00320	-0.00319
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00318	-0.00320	-0.00319

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)	0.00211	0.00212	0.00195
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00188	0.00190	0.00189
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00318	0.00321	0.00320
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00318	0.00321	0.00320

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00542	0.99443
sky130_osu_sc_18T_ms__buf_2	0.00542	1.97682
sky130_osu_sc_18T_ms__buf_4	0.00541	3.80002
sky130_osu_sc_18T_ms__buf_6	0.00098	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00542	7.37043
sky130_osu_sc_18T_ms__buf_l	0.00423	0.59901

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.00015	0.00015
sky130_osu_sc_18T_ms__buf_2	0.00000	0.00022	0.00025
sky130_osu_sc_18T_ms__buf_4	0.00000	0.00037	0.00046
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.00066	0.00088
sky130_osu_sc_18T_ms__buf_l	0.00000	0.00011	0.00011

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)**	0.11845	1.06297	9.05189
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.12839	0.96496	9.36141
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.17396	0.94741	9.77480
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.26364	1.00483	10.42350
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.14552	1.23425	9.24098

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)**	0.14997	0.91083	7.58565
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.18758	0.90973	7.93096
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.27744	0.98023	8.41143
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.45676	1.16396	9.05079
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.18466	0.97786	7.48547

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	0.00380	0.00330	0.00313
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00768	0.00740	0.00741
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01613	0.01627	0.01623
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03274	0.03369	0.03461
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00289	0.00251	0.00242

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	0.00943	0.00921	0.00911
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01192	0.01211	0.01204
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01815	0.01922	0.01934
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03051	0.03327	0.03401
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00733	0.00709	0.00700

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
	-0.00049	-0.00050	-0.00049

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
	0.00049	0.00050	0.00049

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00510	0.00515	0.01547	0.97482	0.97162
sky130_osu_sc_18T_ms__dffr_l	0.00510	0.00515	0.01545	0.60053	0.60553

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.00069	0.00085
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.00065	0.00081

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)	0.90026	2.48301	16.13820
	QN->Q (FR)	0.07307	1.24179	13.77050
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.88819	2.60397	15.26980
	QN->Q (FR)	0.09016	1.37709	13.54350

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)	0.72711	2.53014	19.12230
	QN->Q (RF)	0.04470	0.83796	9.44778
	RN->Q (FF)	0.50532	2.45571	21.17400
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.76711	2.81665	18.71410
	QN->Q (RF)	0.04744	0.83683	8.77675
	RN->Q (FF)	0.54725	2.74391	20.75800

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)	0.63863	1.60834	9.80189
	RN->QN (FR)	0.41595	1.53429	11.85790
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.65568	1.75458	9.88914
	RN->QN (FR)	0.43400	1.68096	11.93570

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)**	0.77502	1.47918	6.14895
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.74270	1.44147	5.67661

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)	-0.11958	-0.15401	-0.87498
	setup	CK (R)	0.71143	0.70100	1.64616
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11936	-0.15470	-0.87032
	setup	CK (R)	0.71205	0.70500	1.64580

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)	-0.33744	-0.79445	-9.37874
	setup	CK (R)	0.39619	0.82513	9.46621
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.33658	-0.79250	-9.37847
	setup	CK (R)	0.39250	0.82511	9.46567

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)	-0.11958	-0.15401	-0.87498
	setup	CK (R)	0.71143	0.70100	1.64616
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.11936	-0.15470	-0.87032
	setup	CK (R)	0.71205	0.70500	1.64580

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)	-0.33744	-0.79445	-9.37874
	setup	CK (R)	0.39619	0.82513	9.46621
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.33658	-0.79250	-9.37847
	setup	CK (R)	0.39250	0.82511	9.46567

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)	0.63784	0.63404	1.37172
	removal	CK (R)	-0.11068	-0.12847	-0.12532
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.63820	0.63549	1.36791
	removal	CK (R)	-0.11068	-0.12847	-0.12532

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)	0.63784	0.63404	1.37172
	removal	CK (R)	-0.11068	-0.12847	-0.12532
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.63820	0.63549	1.36791
	removal	CK (R)	-0.11068	-0.12847	-0.12532

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 ()	0.31371	0.72624	13.33370
	min_pulse_width	RN ()	0.31098	0.72624	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.31555	0.72409	13.33370
	min_pulse_width	RN ()	0.31283	0.72409	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 ()	0.41510	0.58838	13.33370
	min_pulse_width	CK ()	0.40852	0.58838	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.37781	0.58838	13.33370
	min_pulse_width	CK ()	0.39755	0.58838	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 ()	0.88906	0.93519	13.33370
	min_pulse_width	CK ()	0.32543	0.71547	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.88755	0.93734	13.33370
	min_pulse_width	CK ()	0.32275	0.71547	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	0.00914	0.00783	-0.00280
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00808	0.00708	0.00222

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	0.01046	0.00988	0.00650
	RN	-0.00133	-0.04699	-0.50535
	RN	0.02364	0.02318	0.01958
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00937	0.00891	0.00743
	RN	-0.00133	-0.03513	-0.31132
	RN	0.02254	0.02220	0.02047

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	0.01046	0.00988	0.00649
	RN	-0.00133	-0.04689	-0.50369
	RN	0.02365	0.02318	0.01958
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00937	0.00891	0.00744
	RN	-0.00133	-0.03531	-0.31391
	RN	0.02254	0.02220	0.02048

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	0.00910	0.00780	-0.00284
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00804	0.00704	0.00194

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	-0.00294	-0.00305	-0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01039	0.00999	0.00966
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00460	0.00423	0.00396
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00294	-0.00305	-0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01039	0.00999	0.00966
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00460	0.00423	0.00396

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	0.00303	0.00307	0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01798	0.01774	0.01746
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00832	0.00811	0.00807
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00303	0.00307	0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01798	0.01774	0.01746
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00832	0.00811	0.00807

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)	0.00379	0.00331	0.00307
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00998	0.00932	0.00892
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)	0.00379	0.00331	0.00307
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00998	0.00932	0.00892

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)	0.00842	0.00811	0.00803
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01795	0.01745	0.01707
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)	0.00842	0.00811	0.00803
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01795	0.01745	0.01707

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)	-0.00056	-0.00113	-0.00143
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00507	0.00415	0.00345
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00092	-0.00151	-0.00181
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00056	-0.00113	-0.00143
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00507	0.00415	0.00346
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00092	-0.00151	-0.00181

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)	0.01404	0.01367	0.01345
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02820	0.02740	0.02649
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02172	0.02119	0.02051
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02850	0.02770	0.02714
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01515	0.01478	0.01464
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01404	0.01367	0.01345
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02820	0.02740	0.02649
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02172	0.02119	0.02051
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02850	0.02771	0.02714
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01515	0.01478	0.01464

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00505	0.00516	0.01095	0.01572	0.99627	0.99860
sky130_osu_sc_18T_ms__dffsr_l	0.00505	0.00516	0.01094	0.01571	0.59899	0.60132

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.00075	0.00090
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.00071	0.00086

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)	0.78383	2.32339	15.89420
	QN->Q (FR)	0.06995	1.21875	13.59430
	RN->Q (RR)	0.63739	2.18953	15.89890
	SN->Q (FR)	0.61968	2.30371	18.81950
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.79970	2.50618	15.25780
	QN->Q (FR)	0.09004	1.36878	13.50560
	RN->Q (RR)	0.65518	2.37372	15.26730
	SN->Q (FR)	0.63514	2.48972	18.14740

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)	0.79155	2.57510	19.05860
	QN->Q (RF)	0.04077	0.79765	9.06294
	RN->Q (FF)	0.53194	2.45672	21.14470
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.84074	2.89079	18.73900
	QN->Q (RF)	0.04730	0.83385	8.76171
	RN->Q (FF)	0.58238	2.77327	20.82140

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)	0.70472	1.67713	9.89872
	RN->QN (FR)	0.44629	1.55804	11.99360
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.72757	1.82978	9.92664
	RN->QN (FR)	0.46941	1.71080	12.00000

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)	0.67539	1.35332	6.06503
	RN->QN (RF)	0.52860	1.22192	6.06771
	SN->QN (FF)	0.51105	1.33589	8.97641
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.66556	1.35237	5.68082
	RN->QN (RF)	0.51940	1.22238	5.69202
	SN->QN (FF)	0.50104	1.33744	8.56622

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)	-0.12126	-0.15874	-0.95734
	setup	CK (R)	0.58983	0.57674	1.50791
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.12440	-0.15866	-0.95701
	setup	CK (R)	0.58791	0.57503	1.50880

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)	-0.37646	-0.82523	-9.56405
	setup	CK (R)	0.44603	0.85139	9.61815
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.37702	-0.82661	-9.56113
	setup	CK (R)	0.44351	0.85139	9.61756

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)	-0.12126	-0.15874	-0.95734
	setup	CK (R)	0.58983	0.57674	1.50791
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.12440	-0.15866	-0.95701
	setup	CK (R)	0.58791	0.57503	1.50880

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)	-0.37646	-0.82523	-9.56405
	setup	CK (R)	0.44603	0.85139	9.61815
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.37702	-0.82661	-9.56113
	setup	CK (R)	0.44351	0.85139	9.61756

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)	0.48137	0.47043	1.20001
	removal	CK (R)	-0.04098	-0.05056	-0.07281
	hold	SN (R)	-0.50162	-0.83949	-7.52158
	setup	SN (R)	0.52730	0.89546	8.70056
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.47778	0.47162	1.19810
	removal	CK (R)	-0.04288	-0.04963	-0.07467
	hold	SN (R)	-0.47684	-0.82062	-7.43847
	setup	SN (R)	0.52594	0.88409	8.61994

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)	0.48137	0.47043	1.20001
	removal	CK (R)	-0.04098	-0.05056	-0.07281
	hold	SN (R)	-0.50589	-0.83949	-7.52158
	hold	SN (R)	-0.50162	-0.84270	-7.52839
	setup	SN (R)	0.52730	0.89376	8.67177
	setup	SN (R)	0.51906	0.89546	8.70056
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.47778	0.47162	1.19810
	removal	CK (R)	-0.04288	-0.04963	-0.07467
	hold	SN (R)	-0.50103	-0.82686	-7.43847
	hold	SN (R)	-0.47684	-0.82062	-7.44896
	setup	SN (R)	0.52594	0.87522	8.58309
	setup	SN (R)	0.49430	0.88409	8.61994

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 ()	0.35168	0.74994	13.33370
	min_pulse_width	RN ()	0.35733	0.74994	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.36659	0.74563	13.33370
	min_pulse_width	RN ()	0.36378	0.74563	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)	0.06450	0.09799	0.88963
	removal	CK (R)	-0.01430	-0.05754	-0.59139
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.06159	0.09727	0.82400
	removal	CK (R)	-0.01430	-0.05754	-0.59035

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)	0.06450	0.09799	0.88963
	removal	CK (R)	-0.01430	-0.05754	-0.59139
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.06159	0.09727	0.82400
	removal	CK (R)	-0.01430	-0.05754	-0.59035

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 ()	0.50835	0.92657	13.33370
	min_pulse_width	SN ()	0.50006	0.93088	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.50257	0.90934	13.33370
	min_pulse_width	SN ()	0.47828	0.91580	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 ()	0.33833	0.58838	13.33370
	min_pulse_width	CK ()	0.42168	0.58838	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.32078	0.58838	13.33370
	min_pulse_width	CK ()	0.41290	0.58838	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 ()	0.76945	0.81241	13.33370
	min_pulse_width	CK ()	0.37957	0.74347	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.76741	0.81025	13.33370
	min_pulse_width	CK ()	0.37677	0.74347	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	0.01111	0.01011	0.00261
	RN	0.02095	0.02016	0.01254
	SN	-0.00133	-0.04760	-0.51646
	SN	0.02274	0.02206	0.01498
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01014	0.00915	0.00438
	RN	0.01997	0.01919	0.01436
	SN	-0.00133	-0.03508	-0.31052
	SN	0.02175	0.02110	0.01637

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	0.01182	0.01136	0.00851
	RN	-0.00133	-0.04760	-0.51646
	RN	0.02442	0.02396	0.02092
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01083	0.01043	0.00900
	RN	-0.00133	-0.03508	-0.31052
	RN	0.02341	0.02300	0.02137

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	0.01183	0.01137	0.00851
	RN	-0.00133	-0.04767	-0.51767
	RN	0.02442	0.02396	0.02090
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01084	0.01045	0.00930
	RN	-0.00133	-0.03516	-0.31172
	RN	0.02341	0.02301	0.02135

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	0.01107	0.01007	0.00260
	RN	0.02092	0.02012	0.01259
	SN	-0.00133	-0.04767	-0.51765
	SN	0.02270	0.02203	0.01470
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01009	0.00910	0.00396
	RN	0.01993	0.01915	0.01407
	SN	-0.00133	-0.03516	-0.31171
	SN	0.02172	0.02106	0.01610

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	-0.00296	-0.00305	-0.00305
	(!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)	0.01331	0.01293	0.01263
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00520	0.00485	0.00458
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00517	0.00483	0.00455
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00524	0.00490	0.00461
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00296	-0.00305	-0.00305
	(!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)	0.01331	0.01294	0.01263
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00520	0.00485	0.00458
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00517	0.00483	0.00455
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00524	0.00490	0.00461

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	0.00303	0.00307	0.00305
	(!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)	0.02018	0.01996	0.01956
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00886	0.00868	0.00862
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00890	0.00872	0.00865
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00883	0.00864	0.00860
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00303	0.00307	0.00305
	(!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)	0.02018	0.01995	0.01954
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00885	0.00867	0.00861
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00889	0.00871	0.00864
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00882	0.00864	0.00857

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)	0.00374	0.00326	0.00291
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01221	0.01153	0.01102
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)	0.00374	0.00328	0.00291
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01222	0.01153	0.01102

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)	0.00916	0.00885	0.00876
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01904	0.01846	0.01802
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)	0.00915	0.00884	0.00875
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01903	0.01845	0.01801

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)	-0.00693	-0.00697	-0.00701
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00710	-0.00723	-0.00718
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00687	-0.00694	-0.00692
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00406	0.00367	0.00322
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)	-0.00693	-0.00697	-0.00701
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00708	-0.00722	-0.00717
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00686	-0.00693	-0.00692
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00407	0.00368	0.00324

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)	0.00699	0.00714	0.00703
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00714	0.00723	0.00718
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00690	0.00697	0.00693
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01412	0.01385	0.01384
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)	0.00699	0.00714	0.00704
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00713	0.00722	0.00717
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00689	0.00697	0.00692
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01411	0.01384	0.01383

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)	-0.00056	-0.00108	-0.00144
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00579	0.00493	0.00423
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00573	0.00490	0.00420
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00076	-0.00133	-0.00164
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00449	0.00343	0.00286
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00056	-0.00108	-0.00144
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00578	0.00493	0.00422
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00572	0.00489	0.00419
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00076	-0.00133	-0.00164
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00449	0.00343	0.00286

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)	0.03123	0.03047	0.02953
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01407	0.01371	0.01348
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02208	0.02163	0.02093
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02215	0.02172	0.02101
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03068	0.02983	0.02911
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01501	0.01462	0.01451
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01824	0.01749	0.01720
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03124	0.03047	0.02953
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01407	0.01371	0.01348
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02208	0.02163	0.02094
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02215	0.02172	0.02101
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03067	0.02983	0.02908
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01501	0.01462	0.01451
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01823	0.01748	0.01719

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00508	0.00878	0.01545	0.98191	0.98788
sky130_osu_sc_18T_ms__dffs_l	0.00508	0.00878	0.01545	0.59856	0.60577

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.00065	0.00072
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.00061	0.00068

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)	0.54872	2.09083	15.84130
	QN->Q (FR)	0.07285	1.23882	13.75270
	SN->Q (FR)	0.45913	2.15861	18.68910
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.55870	2.23582	14.88260
	QN->Q (FR)	0.08992	1.36571	13.47280
	SN->Q (FR)	0.46810	2.30553	17.69350

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)	0.80467	2.61185	19.25850
	QN->Q (RF)	0.04434	0.83492	9.44480
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.83940	2.88384	18.69690
	QN->Q (RF)	0.04714	0.83315	8.74612

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)	0.71231	1.69164	9.96896
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.72501	1.82561	9.94954

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)	0.44454	1.10059	5.84104
	SN->QN (FF)	0.35250	1.17111	8.68698
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.43325	1.08954	5.35047
	SN->QN (FF)	0.34055	1.16071	8.16034

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)	-0.08672	-0.12664	-0.80017
	setup	CK (R)	0.39151	0.38628	1.41048
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08762	-0.12629	-0.79965
	setup	CK (R)	0.38953	0.38081	1.41063

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)	-0.34375	-0.80151	-9.43425
	setup	CK (R)	0.44441	0.83488	9.52308
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.34236	-0.79954	-9.43654
	setup	CK (R)	0.44467	0.83488	9.52296

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)	-0.08672	-0.12664	-0.80017
	setup	CK (R)	0.39151	0.38628	1.41048
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08762	-0.12629	-0.79965
	setup	CK (R)	0.38953	0.38081	1.41063

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)	-0.34375	-0.80151	-9.43425
	setup	CK (R)	0.44441	0.83488	9.52308
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.34236	-0.79954	-9.43654
	setup	CK (R)	0.44467	0.83488	9.52296

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)	0.09833	0.13320	1.09698
	removal	CK (R)	-0.02697	-0.07748	-0.83567
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.09410	0.13024	1.07632
	removal	CK (R)	-0.02697	-0.07748	-0.83567

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)	0.09833	0.13320	1.09698
	removal	CK (R)	-0.02697	-0.07748	-0.83567
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.09410	0.13024	1.07632
	removal	CK (R)	-0.02697	-0.07748	-0.83567

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 ()	0.32795	0.84687	13.33370
	min_pulse_width	SN ()	0.33355	0.84472	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.32084	0.82749	13.33370
	min_pulse_width	SN ()	0.31299	0.83179	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 ()	0.20014	0.58838	13.33370
	min_pulse_width	CK ()	0.43264	0.58838	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.18917	0.58838	13.33370
	min_pulse_width	CK ()	0.41948	0.58838	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 ()	0.56583	0.71332	13.33370
	min_pulse_width	CK ()	0.38201	0.72624	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.56484	0.71547	13.33370
	min_pulse_width	CK ()	0.37928	0.72624	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	0.00913	0.00773	-0.00256
	SN	-0.00133	-0.04719	-0.50902
	SN	0.01968	0.01849	0.00813
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00805	0.00701	0.00208
	SN	-0.00133	-0.03507	-0.31030
	SN	0.01859	0.01779	0.01294

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	0.01042	0.00989	0.00665
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00933	0.00891	0.00750

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	0.01042	0.00989	0.00677
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00933	0.00891	0.00761

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	0.00910	0.00769	-0.00312
	SN	-0.00133	-0.04736	-0.51209
	SN	0.01965	0.01845	0.00783
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00801	0.00697	0.00201
	SN	-0.00133	-0.03532	-0.31401
	SN	0.01856	0.01775	0.01272

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	-0.00300	-0.00309	-0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01025	0.00983	0.00940
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00447	0.00411	0.00383
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00300	-0.00309	-0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01025	0.00983	0.00940
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00447	0.00411	0.00383

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	0.00307	0.00311	0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01772	0.01746	0.01725
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00848	0.00828	0.00823
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00307	0.00311	0.00308
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01772	0.01746	0.01725
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00848	0.00828	0.00823

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)	-0.00515	-0.00518	-0.00519
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00382	0.00350	0.00327
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)	-0.00515	-0.00518	-0.00519
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00382	0.00350	0.00327

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)	0.00517	0.00523	0.00520
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01011	0.00974	0.00964
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)	0.00517	0.00523	0.00520
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01011	0.00974	0.00964

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)	-0.00057	-0.00108	-0.00145
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00085	-0.00144	-0.00173
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00375	0.00271	0.00212
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00057	-0.00108	-0.00145
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00085	-0.00144	-0.00173
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00375	0.00271	0.00212

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)	0.02803	0.02724	0.02629
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01404	0.01368	0.01345
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02819	0.02727	0.02673
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01506	0.01469	0.01455
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01780	0.01705	0.01678
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02803	0.02723	0.02629
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01404	0.01368	0.01345
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02819	0.02727	0.02673
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01506	0.01469	0.01455
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01780	0.01705	0.01678

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00524	0.01516	1.01192	1.00723
sky130_osu_sc_18T_ms__dff_l	0.00524	0.01514	0.59350	0.59649

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.00063	0.00067
sky130_osu_sc_18T_ms__dff_l	0.00000	0.00059	0.00063

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)	0.44393	1.95267	15.66020
	QN->Q (FR)	0.06948	1.22665	13.66970
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.47127	2.14097	14.78710
	QN->Q (FR)	0.09119	1.37285	13.54010

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)	0.69008	2.47814	19.15730
	QN->Q (RF)	0.04057	0.79660	9.09608
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.74453	2.79052	18.56720
	QN->Q (RF)	0.04719	0.83158	8.72148

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)	0.60615	1.57389	9.82749
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.63268	1.73189	9.80187

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)	0.35044	0.98216	5.67976
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.35066	0.99522	5.26989

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)	-0.08610	-0.12443	-0.83293
	setup	CK (R)	0.28669	0.28348	1.34188
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.08479	-0.12443	-0.83516
	setup	CK (R)	0.28429	0.27970	1.33862

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)	-0.32547	-0.79768	-9.44880
	setup	CK (R)	0.38837	0.83772	9.56777
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.32846	-0.80031	-9.44807
	setup	CK (R)	0.38843	0.83769	9.56779

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 ()	0.16943	0.58838	13.33370
	min_pulse_width	CK ()	0.38439	0.58838	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.16504	0.58838	13.33370
	min_pulse_width	CK ()	0.37561	0.58838	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 ()**	0.46220	0.69824	13.33370
	min_pulse_width	**CK ()**	0.31644	0.72624	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.45819	0.69608	13.33370
	min_pulse_width	**CK ()**	0.31371	0.72624	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	0.00965	0.00848	0.00140
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00866	0.00755	0.00269

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	0.01063	0.01017	0.00740
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00965	0.00924	0.00769

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	0.01063	0.01017	0.00737
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00966	0.00925	0.00770

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	0.00961	0.00846	0.00110
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00862	0.00751	0.00259

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	-0.00294	-0.00304	-0.00304
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00979	0.00944	0.00906
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00294	-0.00304	-0.00304
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00979	0.00944	0.00907

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	0.00302	0.00306	0.00304
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01841	0.01812	0.01786
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00302	0.00306	0.00304
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01841	0.01812	0.01786

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)	-0.00058	-0.00110	-0.00145
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00083	-0.00141	-0.00172
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00058	-0.00110	-0.00145
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00083	-0.00141	-0.00172

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)	0.01399	0.01363	0.01340
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02758	0.02681	0.02587
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02874	0.02777	0.02721
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01500	0.01463	0.01449
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01399	0.01363	0.01340
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02758	0.02682	0.02583
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02874	0.02778	0.02721
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01500	0.01463	0.01449

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00520	0.98613
sky130_osu_sc_18T_ms__inv_10	0.04896	9.11457
sky130_osu_sc_18T_ms__inv_2	0.00998	1.96230
sky130_osu_sc_18T_ms__inv_3	0.01488	2.83544
sky130_osu_sc_18T_ms__inv_4	0.01970	3.80918
sky130_osu_sc_18T_ms__inv_6	0.02954	5.66455
sky130_osu_sc_18T_ms__inv_8	0.03926	7.47331
sky130_osu_sc_18T_ms__inv_l	0.00399	0.59309

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.00007	0.00010
sky130_osu_sc_18T_ms__inv_10	0.00000	0.00073	0.00105
sky130_osu_sc_18T_ms__inv_2	0.00000	0.00015	0.00021
sky130_osu_sc_18T_ms__inv_3	0.00000	0.00022	0.00031
sky130_osu_sc_18T_ms__inv_4	0.00000	0.00029	0.00042
sky130_osu_sc_18T_ms__inv_6	0.00000	0.00044	0.00063
sky130_osu_sc_18T_ms__inv_8	0.00000	0.00059	0.00084
sky130_osu_sc_18T_ms__inv_l	0.00000	0.00005	0.00006

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)**	0.06673	1.16367	12.91490
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.09029	0.82224	12.96000
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.05217	1.00745	12.92230
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.05675	0.94836	12.92130
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.05751	0.90324	12.91810
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.06474	0.85738	12.96400
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.07642	0.83318	12.97310
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.08665	1.31656	12.97360

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)**	0.03652	0.73245	8.33848
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.05750	0.56243	8.32118
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.03080	0.66251	8.33837
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.03337	0.63619	8.37465
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.03363	0.61168	8.36676
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.04143	0.58757	8.38918
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.04922	0.57344	8.38516
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.04212	0.76510	8.07896

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	0.00492	0.00484	0.00485
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04282	0.04306	0.04383
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00887	0.00879	0.00889
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01358	0.01350	0.01362
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01752	0.01741	0.01766
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02604	0.02598	0.02646
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03449	0.03463	0.03518
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00379	0.00371	0.00370

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	-0.00091	-0.00097	-0.00096
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01671	-0.01576	-0.01440
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00300	-0.00306	-0.00296
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00397	-0.00399	-0.00384
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00621	-0.00614	-0.00583
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00947	-0.00941	-0.00871
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01294	-0.01247	-0.01157
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00065	-0.00069	-0.00072

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.53177	0.53554	0.01057	0.88167

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.00024	0.00031

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)	-	0.04154	0.78540	8.85842
	A1->Y (RR)	-	0.04446	0.78830	8.87452
	S0->Y (RR)	(!A0 * A1)	0.09966	0.89663	8.09295
	S0->Y (FR)	(A0 * !A1)	0.08843	1.02233	9.84951

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)	-	0.03265	0.67083	7.57906
	A1->Y (FF)	-	0.02978	0.66587	7.55412
	S0->Y (FF)	(!A0 * A1)	0.15703	0.87417	7.34822
	S0->Y (RF)	(A0 * !A1)	0.04230	0.71277	7.48530

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	-	-0.00506	-0.00507	-0.00507
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00357	-0.00357	-0.00358
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00618	0.00584	0.00577
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00325	-0.00378	-0.00399

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	-	0.00506	0.00507	0.00507
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00357	0.00358	0.00358
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00110	0.00060	0.00039
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01293	0.01258	0.01251

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)	-0.00139	-0.00139	-0.00139

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)	0.00139	0.00139	0.00139

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)	-0.00166	-0.00165	-0.00165

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)	0.00166	0.00165	0.00165

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)	-0.00110	-0.00162	-0.00180
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00107	-0.00160	-0.00180

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)	0.00981	0.00945	0.00939
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00929	0.00895	0.00889

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nand2_1	9.52380
sky130_osu_sc_18T_ms__nand2_1	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00522	0.00515	0.97585
sky130_osu_sc_18T_ms__nand2_1	0.00400	0.00395	0.59500

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.00009	0.00021
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.00007	0.00013

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)	0.06973	1.16943	12.91470
	B->Y (FR)	0.08193	1.17315	12.83510
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.08955	1.32604	13.04080
	B->Y (FR)	0.10502	1.33750	13.02030

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)	0.05483	0.90646	10.04850
	B->Y (RF)	0.06157	0.90145	9.85791
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.06592	0.98078	9.78885
	B->Y (RF)	0.07257	0.97595	9.59336

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	0.00524	0.00515	0.00515
	B	0.00000	0.00000	0.00000
	B	0.00641	0.00629	0.00629
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00398	0.00391	0.00390
	B	0.00000	0.00000	0.00000
	B	0.00482	0.00473	0.00473

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	-0.00056	-0.00064	-0.00066
	B	0.00000	0.00000	0.00000
	B	-0.00054	-0.00059	-0.00062
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00050	-0.00053
	B	0.00000	0.00000	0.00000
	B	-0.00043	-0.00048	-0.00050

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)	-0.00343	-0.00347	-0.00347
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00250	-0.00251	-0.00253

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)	0.00347	0.00351	0.00348
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00253	0.00256	0.00254

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)	-0.00320	-0.00322	-0.00322
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00233	-0.00235	-0.00234

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)	0.00320	0.00327	0.00323
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00233	0.00236	0.00235

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00516	0.00552	0.45045
sky130_osu_sc_18T_ms__nor2_l	0.00389	0.00426	0.26299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.00009	0.00010
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.00007	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (FR)	0.16762	1.54207	13.49920
	B->Y (FR)	0.13732	1.45798	12.96780
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.22177	1.78736	13.48870
	B->Y (FR)	0.19388	1.71094	13.08450

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)	0.04395	0.63459	6.36334
	B->Y (RF)	0.03807	0.62464	6.34356
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.04884	0.65566	6.16945
	B->Y (RF)	0.04372	0.64798	6.15202

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	0.00651	0.00642	0.00643
	B	0.00000	0.00000	0.00000
	B	0.00537	0.00522	0.00517
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00476	0.00464	0.00465
	B	0.00000	0.00000	0.00000
	B	0.00407	0.00393	0.00388

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	0.00039	0.00019	0.00010
	B	0.00000	0.00000	0.00000
	B	-0.00080	-0.00084	-0.00091
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00022	0.00008	0.00001
	B	0.00000	0.00000	0.00000
	B	-0.00054	-0.00056	-0.00064

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)	-0.00296	-0.00307	-0.00305
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00209	-0.00217	-0.00216

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)	0.00304	0.00307	0.00305
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00215	0.00217	0.00216

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)	-0.00187	-0.00190	-0.00188
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00137	-0.00138	-0.00137

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)	0.00194	0.00196	0.00190
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00141	0.00143	0.00139

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00523	0.00523	0.00445	0.45144

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.00009	0.00017

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)	0.18721	1.51844	13.08120
	A1->Y (FR)	0.22487	1.60858	13.61450
	B0->Y (FR)	0.10981	1.21713	11.34410

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)	0.07509	0.76829	7.25915
	A1->Y (RF)	0.08353	0.76482	7.19125
	B0->Y (RF)	0.06076	0.77514	7.61019

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	0.00702	0.00684	0.00677
	A1	0.00000	0.00000	0.00000
	A1	0.00820	0.00807	0.00803
	B0	0.00561	0.00545	0.00545

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	0.00026	0.00023	0.00013
	A1	0.00000	0.00000	0.00000
	A1	0.00146	0.00127	0.00118
	B0	0.00210	0.00201	0.00193

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)	-0.00188	-0.00190	-0.00189
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00298	-0.00308	-0.00306
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00315	-0.00316	-0.00315

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)	0.00195	0.00196	0.00191
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00304	0.00308	0.00306
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00315	0.00321	0.00316

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)	-0.00290	-0.00302	-0.00300
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00297	-0.00307	-0.00305
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00311	-0.00312	-0.00312

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)	0.00298	0.00302	0.00300
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00303	0.00307	0.00305
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00312	0.00314	0.00313

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)	-0.00254	-0.00256	-0.00261

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)	0.00261	0.00266	0.00262

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00501	0.00534	0.00552	0.00535	0.45435

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.00014	0.00021

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)	0.24760	1.63405	13.66010
	A1->Y (FR)	0.21619	1.54765	13.13150
	B0->Y (FR)	0.15169	1.47863	13.06780
	B1->Y (FR)	0.18493	1.56630	13.60510

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)	0.11135	0.82134	7.38044
	A1->Y (RF)	0.09354	0.79500	7.31501
	B0->Y (RF)	0.07846	0.79902	7.65655
	B1->Y (RF)	0.09816	0.83218	7.80306

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	0.01036	0.01024	0.01020
	A1	0.00916	0.00895	0.00889
	B0	0.00693	0.00677	0.00669
	B1	0.00819	0.00807	0.00804

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00214	0.00196	0.00183
	A1	0.00102	0.00095	0.00084
	B0	0.00102	0.00095	0.00082
	B1	0.00217	0.00197	0.00184

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)	-0.00295	-0.00307	-0.00305
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00295	-0.00307	-0.00305
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00297	-0.00308	-0.00305
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00312	-0.00313	-0.00313

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)	0.00303	0.00307	0.00305
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00303	0.00307	0.00305
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00303	0.00308	0.00305
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00313	0.00319	0.00314

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)	-0.00187	-0.00189	-0.00187
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00187	-0.00189	-0.00187
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00295	-0.00305	-0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00311	-0.00313	-0.00312

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)	0.00194	0.00195	0.00189
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00194	0.00195	0.00189
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00301	0.00305	0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00311	0.00313	0.00313

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)	-0.00186	-0.00189	-0.00187
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00186	-0.00189	-0.00187
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00328	-0.00338	-0.00336
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00335	-0.00338	-0.00344

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)	0.00193	0.00195	0.00189
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00193	0.00195	0.00189
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00335	0.00338	0.00336
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00344	0.00352	0.00346

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)	-0.00291	-0.00303	-0.00301
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00291	-0.00303	-0.00301
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00334	-0.00345	-0.00342
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00340	-0.00343	-0.00349

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)	0.00299	0.00303	0.00301
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00299	0.00303	0.00301
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00341	0.00345	0.00342
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00349	0.00353	0.00350

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00549	0.00533	0.98790
sky130_osu_sc_18T_ms__or2_2	0.00548	0.00534	1.95439
sky130_osu_sc_18T_ms__or2_4	0.00549	0.00533	3.78141
sky130_osu_sc_18T_ms__or2_8	0.00549	0.00534	7.27996
sky130_osu_sc_18T_ms__or2_l	0.00428	0.00407	0.59217

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.00014	0.00019
sky130_osu_sc_18T_ms__or2_2	0.00000	0.00020	0.00029
sky130_osu_sc_18T_ms__or2_4	0.00000	0.00032	0.00050
sky130_osu_sc_18T_ms__or2_8	0.00000	0.00055	0.00092
sky130_osu_sc_18T_ms__or2_l	0.00000	0.00011	0.00015

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (RR)	0.12969	1.09112	9.18738
	B->Y (RR)	0.12094	1.06720	9.01542
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.14052	0.98826	9.44185
	B->Y (RR)	0.13113	0.96852	9.32487
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.18664	0.96819	9.87283
	B->Y (RR)	0.17696	0.95356	9.79235
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.27612	1.02199	10.47870
	B->Y (RR)	0.26599	1.01067	10.43490
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.15754	1.26427	9.38507
	B->Y (RR)	0.14910	1.24110	9.23745

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)	0.32015	1.11957	8.44102
	B->Y (FF)	0.27796	1.03173	7.77319
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.40901	1.17743	8.78913
	B->Y (FF)	0.36712	1.09045	8.17910
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.60536	1.37653	9.35577
	B->Y (FF)	0.56358	1.28638	8.82309
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.99403	1.80378	10.10640
	B->Y (FF)	0.95200	1.70915	9.66364
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.40689	1.23172	8.31031
	B->Y (FF)	0.35949	1.14180	7.74497

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	0.00515	0.00470	0.00450
	B	0.00000	0.00000	0.00000
	B	0.00398	0.00358	0.00342
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00904	0.00883	0.00871
	B	0.00000	0.00000	0.00000
	B	0.00785	0.00775	0.00776
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01748	0.01768	0.01748
	B	0.00000	0.00000	0.00000
	B	0.01627	0.01673	0.01676
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03415	0.03518	0.03596
	B	0.00000	0.00000	0.00000
	B	0.03289	0.03411	0.03537
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00380	0.00347	0.00329
	B	0.00000	0.00000	0.00000
	B	0.00304	0.00277	0.00262

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	0.01093	0.01089	0.01080
	B	0.00000	0.00000	0.00000
	B	0.00952	0.00948	0.00941
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01339	0.01386	0.01383
	B	0.00000	0.00000	0.00000
	B	0.01200	0.01245	0.01241
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01950	0.02089	0.02112
	B	0.00000	0.00000	0.00000
	B	0.01812	0.01942	0.01963
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03167	0.03430	0.03570
	B	0.00000	0.00000	0.00000
	B	0.03021	0.03282	0.03412
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00829	0.00822	0.00814
	B	0.00000	0.00000	0.00000
	B	0.00731	0.00724	0.00718

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)	-0.00298	-0.00309	-0.00306
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00298	-0.00309	-0.00306
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00298	-0.00309	-0.00306
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00297	-0.00309	-0.00306
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00211	-0.00218	-0.00217

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)	0.00304	0.00309	0.00306
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00309	0.00306
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00309	0.00306
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00309	0.00306
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00215	0.00218	0.00217

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)	-0.00188	-0.00190	-0.00189
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00190	-0.00189
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00190	-0.00189
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00190	-0.00189
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00140	-0.00140	-0.00139

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)	0.00196	0.00198	0.00191
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00196	0.00198	0.00191
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00196	0.00198	0.00191
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00196	0.00198	0.00191
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00144	0.00145	0.00141

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00552	0.00696	0.45076
sky130_osu_sc_18T_ms__tbufi_l	0.00427	0.00539	0.26277

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.00010	0.00021
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.00008	0.00013

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)	0.13012	1.45140	12.96380
	OE->Y (FR)	0.10375	0.56811	4.28497
	OE->Y (RR)	0.19449	1.38846	9.39289
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.18530	1.70366	13.08000
	OE->Y (FR)	0.12631	0.60462	4.48374
	OE->Y (RR)	0.24829	1.65678	9.65801

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)	0.05242	0.73252	7.27780
	OE->Y (FF)	0.10442	0.56826	4.28493
	OE->Y (RF)	0.05197	0.71885	7.04955
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.06400	0.77417	7.05883
	OE->Y (FF)	0.12727	0.60595	4.48134
	OE->Y (RF)	0.06394	0.75880	6.83577

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	0.00499	0.00484	0.00477
	OE	0.00000	0.00000	0.00000
	OE	0.00463	0.00411	0.00395
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00380	0.00366	0.00359
	OE	0.00000	0.00000	0.00000
	OE	0.00333	0.00296	0.00281

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	-0.00080	-0.00084	-0.00091
	OE	0.00000	0.00000	0.00000
	OE	0.00350	0.00299	0.00281
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00054	-0.00056	-0.00065
	OE	0.00000	0.00000	0.00000
	OE	0.00246	0.00209	0.00195

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)	-0.00271	-0.00274	-0.00272
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00255	-0.00259	-0.00256
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00206	-0.00208	-0.00207
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00195	-0.00197	-0.00196

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)	0.00271	0.00274	0.00272
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00263	0.00265	0.00260
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00206	0.00208	0.00207
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00200	0.00202	0.00198

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)	0.00196	0.00145	0.00127
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00178	0.00126	0.00109
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00136	0.00098	0.00084
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00122	0.00084	0.00070

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)	0.00560	0.00521	0.00508
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00580	0.00539	0.00522
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00443	0.00409	0.00399
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00457	0.00423	0.00410

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00551	0.00856	0.45075
sky130_osu_sc_18T_ms__tnbufi_l	0.00426	0.00640	0.26235

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.00012	0.00015
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.00009	0.00011

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)	0.13146	1.45143	12.96360
	OE->Y (RR)	0.04269	0.35610	4.28494
	OE->Y (FR)	0.15404	1.52905	13.48550
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.18676	1.70236	13.06810
	OE->Y (RR)	0.04614	0.35841	4.28522
	OE->Y (FR)	0.20246	1.77072	13.47350

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)	0.05161	0.73217	7.27745
	OE->Y (RF)	0.04238	0.35599	4.28496
	OE->Y (FF)	0.12102	0.85714	6.47062
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.06276	0.77326	7.05410
	OE->Y (RF)	0.04603	0.35826	4.28524
	OE->Y (FF)	0.15126	0.92913	6.45387

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	0.00512	0.00496	0.00489
	OE	0.00000	0.00000	0.00000
	OE	0.01195	0.01170	0.01168
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00393	0.00379	0.00371
	OE	0.00000	0.00000	0.00000
	OE	0.00890	0.00868	0.00866

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	-0.00095	-0.00099	-0.00105
	OE	0.00000	0.00000	0.00000
	OE	0.01098	0.01075	0.01071
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00069	-0.00071	-0.00079
	OE	0.00000	0.00000	0.00000
	OE	0.00815	0.00793	0.00785

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)	-0.00237	-0.00240	-0.00238
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00222	-0.00226	-0.00223
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00174	-0.00176	-0.00174
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00164	-0.00165	-0.00164

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)	0.00237	0.00240	0.00238
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00229	0.00231	0.00227
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00174	0.00176	0.00174
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00168	0.00169	0.00166

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)	-0.00374	-0.00439	-0.00461
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00358	-0.00432	-0.00455
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00260	-0.00308	-0.00323
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00250	-0.00302	-0.00318

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)	0.00929	0.00902	0.00901
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00912	0.00885	0.00882
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00694	0.00671	0.00668
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00682	0.00660	0.00653

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01087	0.00984	0.45363

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.00028	0.00036

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	0.25098	1.46275	9.62135
	A->Y (FR)	!B	0.17632	1.50530	13.03960
	B->Y (RR)	A	0.20595	1.41441	9.51265
	B->Y (FR)	!A	0.21655	1.59154	13.56050

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	0.19560	0.96885	6.95648
	A->Y (RF)	!B	0.07817	0.75186	7.18282
	B->Y (FF)	A	0.18650	0.95693	6.94595
	B->Y (RF)	!A	0.08655	0.76355	7.19547

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	0.00429	0.00372	0.00347
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01224	0.01173	0.01153
	B	A	0.00000	0.00000	0.00000
	B	A	0.00207	0.00155	0.00133
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01298	0.01257	0.01246

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	0.01458	0.01400	0.01371
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00332	0.00279	0.00250
	B	A	0.00000	0.00000	0.00000
	B	A	0.01358	0.01334	0.01325
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00402	0.00336	0.00304

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01084	0.00989	0.45007

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.00028	0.00033

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	0.25331	1.45104	9.51720
	A->Y (FR)	B	0.19437	1.56373	13.52290
	B->Y (RR)	!A	0.21069	1.41662	9.49146
	B->Y (FR)	A	0.21370	1.58987	13.53710

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	0.18949	0.95240	6.86872
	A->Y (RF)	B	0.06780	0.75239	7.29729
	B->Y (FF)	!A	0.17922	0.94133	6.83725
	B->Y (RF)	A	0.07866	0.74761	7.07379

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	0.01385	0.01338	0.01334
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00276	0.00178	0.00144
	B	A	0.00000	0.00000	0.00000
	B	A	0.01414	0.01378	0.01369
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00180	0.00126	0.00104

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	0.00273	0.00201	0.00166
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01522	0.01493	0.01479
	B	A	0.00000	0.00000	0.00000
	B	A	0.00272	0.00204	0.00171
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01385	0.01369	0.01359

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ss_1P44_-40C.ccs
Cell Library: Process , Voltage 1.44, Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_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	0.16771
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	86774.20000	173548.00000
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
	-0.00304	0.01226	0.17625

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
	1.51171	1.41278	0.24732