sky130_osu_sc_18T_ms_ss_1P60_-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_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.02076	0.02081	0.01605	1.48243	0.67801	1.46109
sky130_osu_sc_18T_ms__addf_l	0.02073	0.02080	0.01605	0.90011	0.67220	0.90032

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.00110	0.00131
sky130_osu_sc_18T_ms__addf_l	0.00000	0.00091	0.00131

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)	0.21891	2.06608	24.11100
	B->CO (RR)	0.19711	1.96693	23.07200
	CI->CO (RR)	0.20955	2.08677	24.54210
	CON->CO (FR)	0.04773	0.99986	12.49470
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.22766	1.93662	19.14510
	B->CO (RR)	0.20634	1.85848	18.55350
	CI->CO (RR)	0.21831	1.95724	19.60720
	CON->CO (FR)	0.06080	1.13207	12.59820

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)	0.39066	3.13126	35.83820
	B->CO (FF)	0.35677	3.01121	34.63190
	CI->CO (FF)	0.34916	3.05562	35.47370
	CON->CO (RF)	0.03199	0.69660	8.75104
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.38430	2.66086	25.54110
	B->CO (FF)	0.35123	2.56596	24.78660
	CI->CO (FF)	0.34279	2.58688	25.21640
	CON->CO (RF)	0.03506	0.71099	8.20374

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)	0.28117	1.45458	12.92010
	B->CON (FR)	0.25053	1.38601	12.59300
	CI->CON (FR)	0.23967	1.37915	12.63180
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.26650	1.43578	12.84400
	B->CON (FR)	0.23681	1.36816	12.51510
	CI->CON (FR)	0.22498	1.36024	12.55260

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)	0.11645	0.74740	7.17709
	B->CON (RF)	0.10735	0.73308	7.24840
	CI->CON (RF)	0.10708	0.77096	7.66707
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.11200	0.74116	7.14362
	B->CON (RF)	0.10339	0.72767	7.21706
	CI->CON (RF)	0.10257	0.76478	7.63356

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)	0.54315	3.10964	30.35220
	B->S (-R)	0.53913	3.06922	29.85090
	CI->S (-R)	0.49876	3.02894	29.98410
	CON->S (RR)	0.12907	0.96637	8.81745
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.52422	2.79544	23.86400
	B->S (-R)	0.52077	2.76828	23.61030
	CI->S (-R)	0.47974	2.71660	23.51750
	CON->S (RR)	0.13630	1.07471	8.73142

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)	0.38732	1.92151	17.82210
	B->S (-F)	0.40346	1.85265	17.18490
	CI->S (-F)	0.37717	1.93589	18.22710
	CON->S (FF)	0.17636	0.91027	7.53005
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.36643	1.68388	13.70030
	B->S (-F)	0.38250	1.63034	13.34930
	CI->S (-F)	0.35596	1.69940	14.14410
	CON->S (FF)	0.16945	0.90193	6.90948

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	0.00371	0.00358	0.00341
	B	0.00465	0.00464	0.00459
	CI	0.00497	0.00507	0.00504
sky130_osu_sc_18T_ms__addf_l	A	0.00287	0.00262	0.00246
	B	0.00381	0.00370	0.00359
	CI	0.00413	0.00413	0.00405

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01448	0.01449	0.01441
	B	0.01425	0.01443	0.01441
	CI	0.01245	0.01282	0.01282
sky130_osu_sc_18T_ms__addf_l	A	0.01364	0.01361	0.01350
	B	0.01341	0.01353	0.01345
	CI	0.01160	0.01193	0.01188

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01447	0.01443	0.01433
	B	0.01424	0.01438	0.01428
	CI	0.01244	0.01280	0.01272
sky130_osu_sc_18T_ms__addf_l	A	0.01364	0.01356	0.01346
	B	0.01340	0.01351	0.01340
	CI	0.01160	0.01190	0.01184

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00366	0.00352	0.00336
	B	0.00460	0.00460	0.00436
	CI	0.00496	0.00504	0.00495
sky130_osu_sc_18T_ms__addf_l	A	0.00283	0.00260	0.00239
	B	0.00377	0.00368	0.00341
	CI	0.00412	0.00412	0.00400

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01448	0.01449	0.01434
	B	0.01425	0.01443	0.01438
	CI	0.01245	0.01282	0.01281
sky130_osu_sc_18T_ms__addf_l	A	0.01365	0.01362	0.01354
	B	0.01342	0.01354	0.01349
	CI	0.01161	0.01194	0.01190

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.03052	0.03080	0.03080
	B	0.02738	0.02697	0.02685
	CI	0.02441	0.02449	0.02443
sky130_osu_sc_18T_ms__addf_l	A	0.02942	0.02946	0.02937
	B	0.02630	0.02565	0.02562
	CI	0.02332	0.02331	0.02317

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.01028	0.01112	1.45439	0.70954	1.47556
sky130_osu_sc_18T_ms__addh_l	0.01028	0.01113	0.87786	0.71723	0.88479

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.00106	0.00125
sky130_osu_sc_18T_ms__addh_l	0.00000	0.00089	0.00112

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)	0.15381	0.97476	8.50227
	B->CO (RR)	0.15863	0.97423	8.67025
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.15550	1.07934	8.46019
	B->CO (RR)	0.16038	1.08213	8.63225

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)	0.15077	0.87340	7.49570
	B->CO (FF)	0.16055	0.88687	7.54417
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.14880	0.91594	7.32485
	B->CO (FF)	0.15807	0.92967	7.37520

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	0.21380	0.83338	5.01802
	A->CON (FR)	!B	0.16309	1.28190	12.48190
	B->CON (RR)	A	0.21863	0.83265	5.17258
	B->CON (FR)	!A	0.19523	1.34848	12.84050
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.19075	0.80135	4.93641
	A->CON (FR)	!B	0.14433	1.26739	12.54020
	B->CON (RR)	A	0.19586	0.80354	5.09360
	B->CON (FR)	!A	0.17658	1.33396	12.87990

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	0.20762	0.92694	6.68881
	A->CON (RF)	!B	0.07176	0.72580	7.62316
	B->CON (FF)	A	0.21207	0.96247	6.98635
	B->CON (RF)	!A	0.08137	0.71526	7.36449
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.18628	0.88984	6.50593
	A->CON (RF)	!B	0.06600	0.72205	7.65265
	B->CON (FF)	A	0.19050	0.92658	6.81158
	B->CON (RF)	!A	0.07588	0.71145	7.39266

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	0.16113	1.98299	23.86640
	A->S (FR)	B	0.29666	2.15104	22.57150
	B->S (RR)	!A	0.16906	1.91215	22.82130
	B->S (FR)	A	0.30362	2.24393	23.65560
	CON->S (FR)	-	0.05218	1.02118	12.70910
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.16068	1.84695	19.00000
	A->S (FR)	B	0.28104	1.99786	17.69250
	B->S (RR)	!A	0.16919	1.79663	18.36500
	B->S (FR)	A	0.28746	2.06939	18.39140
	CON->S (FR)	-	0.06143	1.14937	12.70490

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	0.25245	2.80616	33.59200
	A->S (RF)	B	0.27903	1.80601	17.99690
	B->S (FF)	!A	0.28467	2.87811	33.99080
	B->S (RF)	A	0.28401	1.80569	18.15790
	CON->S (RF)	-	0.02997	0.68071	8.55873
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.23999	2.41641	24.44420
	A->S (RF)	B	0.26038	1.59912	13.03580
	B->S (FF)	!A	0.27212	2.48386	24.81940
	B->S (RF)	A	0.26542	1.60104	13.20790
	CON->S (RF)	-	0.03489	0.74516	8.55830

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	0.00630	0.00597	0.00538
	B	0.00000	0.00000	0.00000
	B	0.00581	0.00550	0.00487
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00510	0.00469	0.00444
	B	0.00000	0.00000	0.00000
	B	0.00461	0.00423	0.00390

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	0.01003	0.00965	0.00904
	B	0.00000	0.00000	0.00000
	B	0.01042	0.01043	0.00985
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00883	0.00841	0.00808
	B	0.00000	0.00000	0.00000
	B	0.00923	0.00915	0.00893

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	0.00629	0.00602	0.00594
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00872	0.00872	0.00864
	B	A	0.00000	0.00000	0.00000
	B	A	0.00579	0.00558	0.00528
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00954	0.00952	0.00927
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00510	0.00468	0.00450
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00795	0.00790	0.00783
	B	A	0.00000	0.00000	0.00000
	B	A	0.00461	0.00422	0.00418
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00876	0.00869	0.00818

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	0.01003	0.00967	0.00921
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00138	0.00135	0.00121
	B	A	0.00000	0.00000	0.00000
	B	A	0.01042	0.01042	0.01026
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00231	0.00217	0.00183
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00882	0.00841	0.00794
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00035	0.00030	-0.00024
	B	A	0.00000	0.00000	0.00000
	B	A	0.00923	0.00914	0.00899
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00127	0.00111	0.00080

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	0.01005	0.00966	0.00929
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00139	0.00140	0.00123
	B	A	0.00000	0.00000	0.00000
	B	A	0.01043	0.01043	0.01019
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00232	0.00220	0.00204
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00884	0.00842	0.00804
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00035	0.00031	0.00018
	B	A	0.00000	0.00000	0.00000
	B	A	0.00923	0.00915	0.00893
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00128	0.00113	0.00099

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	0.00630	0.00597	0.00548
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00871	0.00876	0.00865
	B	A	0.00000	0.00000	0.00000
	B	A	0.00581	0.00550	0.00495
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00953	0.00957	0.00945
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00510	0.00468	0.00447
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00794	0.00788	0.00787
	B	A	0.00000	0.00000	0.00000
	B	A	0.00461	0.00422	0.00392
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00876	0.00872	0.00867

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00551	0.00558	1.46724
sky130_osu_sc_18T_ms__and2_2	0.00551	0.00558	2.88703
sky130_osu_sc_18T_ms__and2_4	0.00551	0.00558	5.58806
sky130_osu_sc_18T_ms__and2_6	0.00554	0.00558	8.18645
sky130_osu_sc_18T_ms__and2_8	0.00552	0.00559	10.65693
sky130_osu_sc_18T_ms__and2_l	0.00422	0.00430	0.90094

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.00050	0.00077
sky130_osu_sc_18T_ms__and2_2	0.00000	0.00079	0.00082
sky130_osu_sc_18T_ms__and2_4	0.00000	0.00135	0.00151
sky130_osu_sc_18T_ms__and2_6	0.00000	0.00191	0.00223
sky130_osu_sc_18T_ms__and2_8	0.00000	0.00247	0.00295
sky130_osu_sc_18T_ms__and2_l	0.00000	0.00026	0.00037

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)	0.11708	0.89318	8.11229
	B->Y (RR)	0.12333	0.90348	8.31520
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.13514	0.82936	8.41098
	B->Y (RR)	0.14135	0.82979	8.58010
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.18786	0.84798	8.94543
	B->Y (RR)	0.19406	0.83804	9.06827
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.23877	0.89125	9.29287
	B->Y (RR)	0.24474	0.87519	9.36580
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.28957	0.94470	9.62014
	B->Y (RR)	0.29569	0.92591	9.67174
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.14102	1.05239	8.44595
	B->Y (RR)	0.14776	1.05921	8.62910

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)	0.11277	0.78518	6.96134
	B->Y (FF)	0.12070	0.80543	7.05367
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.13592	0.77892	7.23095
	B->Y (FF)	0.14458	0.79303	7.31667
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.19556	0.82791	7.73003
	B->Y (FF)	0.20420	0.83882	7.78930
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.25758	0.88630	8.03853
	B->Y (FF)	0.26622	0.89696	8.10111
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.31613	0.94642	8.25161
	B->Y (FF)	0.32526	0.95632	8.31227
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.13478	0.84789	6.80337
	B->Y (FF)	0.14557	0.86960	6.90502

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	0.00499	0.00431	0.00426
	B	0.00000	0.00000	0.00000
	B	0.00508	0.00441	0.00420
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00992	0.00954	0.00942
	B	0.00000	0.00000	0.00000
	B	0.01002	0.00965	0.00951
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02054	0.02084	0.02117
	B	0.00000	0.00000	0.00000
	B	0.02063	0.02101	0.02148
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03101	0.03190	0.03339
	B	0.00000	0.00000	0.00000
	B	0.03111	0.03209	0.03351
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04147	0.04315	0.04430
	B	0.00000	0.00000	0.00000
	B	0.04156	0.04293	0.04433
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00368	0.00316	0.00305
	B	0.00000	0.00000	0.00000
	B	0.00376	0.00325	0.00310

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	0.01216	0.01195	0.01205
	B	0.00000	0.00000	0.00000
	B	0.01365	0.01343	0.01348
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01528	0.01578	0.01594
	B	0.00000	0.00000	0.00000
	B	0.01679	0.01719	0.01726
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02291	0.02471	0.02526
	B	0.00000	0.00000	0.00000
	B	0.02442	0.02603	0.02647
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03068	0.03369	0.03482
	B	0.00000	0.00000	0.00000
	B	0.03212	0.03488	0.03576
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03806	0.04240	0.04419
	B	0.00000	0.00000	0.00000
	B	0.03963	0.04342	0.04485
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00933	0.00911	0.00909
	B	0.00000	0.00000	0.00000
	B	0.01042	0.01021	0.01014

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)	-0.00452	-0.00457	-0.00456
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00453	-0.00456
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00453	-0.00456
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00454	-0.00459	-0.00458
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00457	-0.00456
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00330	-0.00330	-0.00333

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)	0.00455	0.00459	0.00457
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00455	0.00459	0.00457
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00455	0.00459	0.00457
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00457	0.00461	0.00459
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00455	0.00459	0.00457
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00333	0.00336	0.00334

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)	-0.00429	-0.00432	-0.00430
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00429	-0.00431	-0.00430
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00429	-0.00432	-0.00431
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00429	-0.00431	-0.00430
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00429	-0.00432	-0.00430
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00313	-0.00315	-0.00315

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)	0.00429	0.00432	0.00432
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00429	0.00432	0.00432
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00429	0.00432	0.00432
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00429	0.00432	0.00432
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00429	0.00432	0.00432
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00314	0.00319	0.00315

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00516	0.00539	0.00524	0.67982

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.00023	0.00036

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)	0.14907	1.32725	12.86170
	A1->Y (FR)	0.12674	1.26686	12.51810
	B0->Y (FR)	0.11311	1.25664	12.55400

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)	0.06160	0.66869	6.89890
	A1->Y (RF)	0.05565	0.68136	7.21166
	B0->Y (RF)	0.04041	0.66922	7.33841

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	0.01027	0.01015	0.01012
	A1	0.00000	0.00000	0.00000
	A1	0.00869	0.00854	0.00851
	B0	0.00836	0.00818	0.00816

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	0.00159	0.00128	0.00112
	A1	0.00000	0.00000	0.00000
	A1	0.00161	0.00122	0.00111
	B0	-0.00110	-0.00112	-0.00121

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)	-0.00387	-0.00397	-0.00398
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00405	-0.00408	-0.00407
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00406	-0.00410	-0.00407

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)	0.00396	0.00397	0.00398
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00405	0.00410	0.00408
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00406	0.00410	0.00408

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)	-0.00382	-0.00395	-0.00394
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00401	-0.00403	-0.00402
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00431	-0.00434	-0.00436

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)	0.00391	0.00395	0.00394
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00401	0.00403	0.00403
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00434	0.00440	0.00437

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)	-0.00227	-0.00230	-0.00228

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)	0.00246	0.00248	0.00233

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00517	0.00539	0.00561	0.00535	0.66239

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.00031	0.00072

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)	0.19010	1.37793	12.85250
	A1->Y (FR)	0.16842	1.33372	12.68750
	B0->Y (FR)	0.11970	1.25002	12.37360
	B1->Y (FR)	0.14142	1.29388	12.58470

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)	0.07846	0.68262	6.84212
	A1->Y (RF)	0.07252	0.69512	7.15220
	B0->Y (RF)	0.04512	0.66340	7.11664
	B1->Y (RF)	0.05084	0.64915	6.80766

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	0.01258	0.01244	0.01164
	A1	0.01105	0.01073	0.01079
	B0	0.00897	0.00869	0.00867
	B1	0.01046	0.01025	0.01021

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00365	0.00335	0.00313
	A1	0.00368	0.00330	0.00313
	B0	-0.00073	-0.00075	-0.00085
	B1	-0.00066	-0.00069	-0.00081

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)	-0.00386	-0.00400	-0.00398
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00405	-0.00409	-0.00407
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00405	-0.00408	-0.00407
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00405	-0.00410	-0.00407

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)	0.00396	0.00403	0.00398
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00405	0.00410	0.00408
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00405	0.00410	0.00408
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00405	0.00410	0.00408

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)	-0.00382	-0.00396	-0.00393
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00402	-0.00404	-0.00402
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00431	-0.00433	-0.00436
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00431	-0.00433	-0.00436

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)	0.00391	0.00399	0.00393
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00402	0.00409	0.00404
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00434	0.00439	0.00437
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00434	0.00439	0.00437

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)	-0.00228	-0.00231	-0.00229
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00228	-0.00229	-0.00229
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00442	-0.00446	-0.00447
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00442	-0.00447	-0.00447

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)	0.00254	0.00255	0.00235
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00228	0.00229	0.00229
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00445	0.00454	0.00448
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00445	0.00454	0.00448

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)	-0.00230	-0.00232	-0.00231
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00229	-0.00230	-0.00230
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00412	-0.00415	-0.00413
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00412	-0.00415	-0.00413

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)	0.00255	0.00256	0.00237
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00229	0.00230	0.00230
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00412	0.00415	0.00414
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00412	0.00415	0.00414

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00561	1.45771
sky130_osu_sc_18T_ms__buf_2	0.00561	2.93023
sky130_osu_sc_18T_ms__buf_4	0.00561	5.63921
sky130_osu_sc_18T_ms__buf_6	0.00098	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00561	10.77175
sky130_osu_sc_18T_ms__buf_l	0.00436	0.88801

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.00041	0.00041
sky130_osu_sc_18T_ms__buf_2	0.00000	0.00061	0.00077
sky130_osu_sc_18T_ms__buf_4	0.00000	0.00102	0.00148
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.00184	0.00291
sky130_osu_sc_18T_ms__buf_l	0.00000	0.00021	0.00021

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)**	0.08988	0.85270	8.02886
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.09896	0.78017	8.41429
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.13400	0.77490	8.83726
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.20183	0.83387	9.35287
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.10811	1.00024	8.24407

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)**	0.10742	0.77460	6.88495
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.13149	0.77444	7.26228
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.19118	0.82317	7.73551
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.31232	0.94279	8.28121
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.13014	0.83792	6.70645

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	0.00465	0.00387	0.00388
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00962	0.00910	0.00896
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02032	0.02050	0.02093
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04128	0.04278	0.04452
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00354	0.00294	0.00284

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	0.01179	0.01153	0.01165
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01489	0.01525	0.01536
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02255	0.02411	0.02458
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03778	0.04161	0.04317
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00915	0.00888	0.00887

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
	-0.00061	-0.00062	-0.00061

Passive power(pJ) for A falling :

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

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00531	0.00535	0.01576	1.45858	1.44328
sky130_osu_sc_18T_ms__dffr_l	0.00531	0.00535	0.01577	0.88941	0.89484

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.00161	0.00220
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.00141	0.00200

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)	0.59769	1.98477	15.95780
	QN->Q (FR)	0.05420	1.08908	13.56920
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.59001	2.08047	14.69730
	QN->Q (FR)	0.06501	1.18651	13.15620

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)	0.50561	2.02669	18.20200
	QN->Q (RF)	0.03722	0.79511	9.92364
	RN->Q (FF)	0.36169	2.03485	20.03830
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.53016	2.24316	17.44550
	QN->Q (RF)	0.03893	0.78414	8.98423
	RN->Q (FF)	0.38721	2.25131	19.28040

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)	0.44512	1.24396	8.69876
	RN->QN (FR)	0.30090	1.25082	10.54030
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.45570	1.36165	8.71467
	RN->QN (FR)	0.31208	1.36861	10.54440

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)**	0.51201	1.11514	5.55417
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.49089	1.08932	4.94272

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)	-0.09304	-0.12213	-0.66494
	setup	CK (R)	0.46956	0.47578	1.63220
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09287	-0.12110	-0.66362
	setup	CK (R)	0.47036	0.47666	1.63641

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)	-0.22626	-0.61779	-6.98498
	setup	CK (R)	0.26547	0.63571	7.03102
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.22371	-0.61793	-6.98570
	setup	CK (R)	0.26424	0.63571	7.03026

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)	-0.09304	-0.12213	-0.66494
	setup	CK (R)	0.46956	0.47578	1.63220
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.09287	-0.12110	-0.66362
	setup	CK (R)	0.47036	0.47666	1.63641

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)	-0.22626	-0.61779	-6.98498
	setup	CK (R)	0.26547	0.63571	7.03102
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.22371	-0.61793	-6.98570
	setup	CK (R)	0.26424	0.63571	7.03026

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)	0.41464	0.42317	1.38750
	removal	CK (R)	-0.08288	-0.09463	-0.13306
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.41581	0.42352	1.38876
	removal	CK (R)	-0.08288	-0.09463	-0.13306

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)	0.41464	0.42317	1.38750
	removal	CK (R)	-0.08288	-0.09463	-0.13306
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.41581	0.42352	1.38876
	removal	CK (R)	-0.08288	-0.09463	-0.13306

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 ()	0.22035	0.57782	13.33370
	min_pulse_width	RN ()	0.22035	0.57782	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.22173	0.57565	13.33370
	min_pulse_width	RN ()	0.21880	0.57348	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 ()	0.27096	0.55176	13.33370
	min_pulse_width	CK ()	0.27302	0.55176	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.24825	0.55176	13.33370
	min_pulse_width	CK ()	0.26476	0.55176	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 ()	0.59121	0.65819	13.33370
	min_pulse_width	CK ()	0.21521	0.55176	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.59010	0.66253	13.33370
	min_pulse_width	CK ()	0.21521	0.55176	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	0.01136	0.00880	-0.00252
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01003	0.00818	-0.00271

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	0.01323	0.01201	0.00252
	RN	-0.00162	-0.07344	-0.93349
	RN	0.03017	0.02914	0.01925
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01185	0.01099	0.00716
	RN	-0.00162	-0.05458	-0.56922
	RN	0.02878	0.02811	0.02387

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	0.01323	0.01202	0.00255
	RN	-0.00162	-0.07297	-0.92370
	RN	0.03017	0.02914	0.01932
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01186	0.01100	0.00715
	RN	-0.00162	-0.05478	-0.57270
	RN	0.02878	0.02811	0.02389

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	0.01133	0.00879	-0.00255
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00813	-0.00309

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	-0.00377	-0.00396	-0.00396
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01331	0.01265	0.01224
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00592	0.00529	0.00500
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00377	-0.00396	-0.00396
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01331	0.01265	0.01224
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00592	0.00529	0.00500

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	0.00394	0.00398	0.00396
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02326	0.02293	0.02257
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01078	0.01054	0.01042
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00394	0.00398	0.00396
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02326	0.02293	0.02257
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01078	0.01054	0.01042

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)	0.00465	0.00393	0.00368
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01250	0.01147	0.01105
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)	0.00465	0.00393	0.00368
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01250	0.01147	0.01105

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)	0.01063	0.01022	0.01025
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02285	0.02210	0.02172
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)	0.01063	0.01022	0.01025
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02285	0.02210	0.02172

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)	-0.00082	-0.00171	-0.00197
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00648	0.00496	0.00420
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00224	-0.00249
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00082	-0.00171	-0.00197
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00648	0.00496	0.00420
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00224	-0.00249

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)	0.01751	0.01705	0.01691
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03586	0.03462	0.03347
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02768	0.02677	0.02597
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03611	0.03500	0.03466
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01921	0.01872	0.01873
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01751	0.01705	0.01691
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03586	0.03462	0.03347
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02768	0.02677	0.02597
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03611	0.03500	0.03466
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01921	0.01872	0.01873

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00527	0.00535	0.01135	0.01606	1.48307	1.48501
sky130_osu_sc_18T_ms__dffsr_l	0.00527	0.00535	0.01134	0.01606	0.90033	0.89465

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.00179	0.00226
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.00159	0.00206

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)	0.53254	1.87658	15.59530
	QN->Q (FR)	0.05175	1.06264	13.29220
	RN->Q (RR)	0.43091	1.78715	15.66160
	SN->Q (FR)	0.41262	1.91356	18.30110
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.54420	2.04079	14.90810
	QN->Q (FR)	0.06490	1.19026	13.22050
	RN->Q (RR)	0.44348	1.95270	14.96790
	SN->Q (FR)	0.42412	2.07940	17.58590

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)	0.55121	2.04577	17.94290
	QN->Q (RF)	0.03381	0.74946	9.40647
	RN->Q (FF)	0.37866	2.02231	19.82950
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.58296	2.31113	17.68310
	QN->Q (RF)	0.03881	0.78571	9.02052
	RN->Q (FF)	0.41029	2.28869	19.56490

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)	0.49234	1.29051	8.75916
	RN->QN (FR)	0.32024	1.26860	10.65140
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.50752	1.41751	8.76591
	RN->QN (FR)	0.33533	1.39552	10.65080

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)	0.45715	1.04115	5.48285
	RN->QN (RF)	0.35572	0.95292	5.54433
	SN->QN (FF)	0.33749	1.07929	8.18086
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.45148	1.04523	4.99545
	RN->QN (RF)	0.35057	0.95802	5.05322
	SN->QN (FF)	0.33183	1.08441	7.66350

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)	-0.09195	-0.12600	-0.73111
	setup	CK (R)	0.40031	0.40105	1.55465
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09225	-0.12600	-0.73197
	setup	CK (R)	0.39886	0.39971	1.55706

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)	-0.24833	-0.64063	-7.15457
	setup	CK (R)	0.29874	0.65539	7.18171
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.24827	-0.64100	-7.15640
	setup	CK (R)	0.29773	0.65532	7.18152

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)	-0.09195	-0.12600	-0.73111
	setup	CK (R)	0.40031	0.40105	1.55465
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09225	-0.12600	-0.73197
	setup	CK (R)	0.39886	0.39971	1.55706

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)	-0.24833	-0.64063	-7.15457
	setup	CK (R)	0.29874	0.65539	7.18171
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.24827	-0.64100	-7.15640
	setup	CK (R)	0.29773	0.65532	7.18152

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)	0.31913	0.32240	1.28179
	removal	CK (R)	-0.03149	-0.03771	-0.07494
	hold	SN (R)	-0.33106	-0.62022	-5.14751
	setup	SN (R)	0.35351	0.66731	6.70884
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.31618	0.32261	1.28289
	removal	CK (R)	-0.03149	-0.03771	-0.07494
	hold	SN (R)	-0.31984	-0.60945	-5.08760
	setup	SN (R)	0.35171	0.65915	6.62851

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)	0.31913	0.32240	1.28179
	removal	CK (R)	-0.03149	-0.03771	-0.07494
	hold	SN (R)	-0.33385	-0.62022	-5.14751
	hold	SN (R)	-0.33106	-0.62188	-5.15810
	setup	SN (R)	0.35351	0.66602	6.64378
	setup	SN (R)	0.34412	0.66731	6.70884
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.31618	0.32261	1.28289
	removal	CK (R)	-0.03149	-0.03771	-0.07494
	hold	SN (R)	-0.32814	-0.60945	-5.08760
	hold	SN (R)	-0.31984	-0.61010	-5.10546
	setup	SN (R)	0.35171	0.65497	6.50299
	setup	SN (R)	0.33101	0.65915	6.62851

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 ()	0.24918	0.60171	13.33370
	min_pulse_width	RN ()	0.25370	0.60171	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.25197	0.59737	13.33370
	min_pulse_width	RN ()	0.25197	0.59737	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)	0.05379	0.09029	1.68822
	removal	CK (R)	-0.01725	-0.06034	-0.57249
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.05259	0.08886	1.56715
	removal	CK (R)	-0.01725	-0.06034	-0.57544

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)	0.05379	0.09029	1.68822
	removal	CK (R)	-0.01725	-0.06034	-0.57249
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.05259	0.08886	1.56715
	removal	CK (R)	-0.01725	-0.06034	-0.57544

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 ()	0.32962	0.69945	13.33370
	min_pulse_width	SN ()	0.32796	0.70163	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.32990	0.68859	13.33370
	min_pulse_width	SN ()	0.31265	0.69076	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 ()	0.22966	0.55176	13.33370
	min_pulse_width	CK ()	0.28335	0.55176	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.21934	0.55176	13.33370
	min_pulse_width	CK ()	0.27922	0.55176	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 ()	0.51910	0.60823	13.33370
	min_pulse_width	CK ()	0.25351	0.56913	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.51954	0.60606	13.33370
	min_pulse_width	CK ()	0.25138	0.56913	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	0.01402	0.01213	-0.00569
	RN	0.02650	0.02494	0.00784
	SN	-0.00162	-0.07417	-0.94916
	SN	0.02906	0.02762	0.01094
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01279	0.01096	-0.00009
	RN	0.02526	0.02377	0.01254
	SN	-0.00162	-0.05498	-0.57621
	SN	0.02781	0.02646	0.01528

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	0.01503	0.01403	0.00606
	RN	-0.00162	-0.07417	-0.94916
	RN	0.03108	0.03011	0.02190
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01378	0.01300	0.00925
	RN	-0.00162	-0.05498	-0.57621
	RN	0.02981	0.02906	0.02500

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	0.01503	0.01404	0.00608
	RN	-0.00162	-0.07423	-0.95040
	RN	0.03108	0.03011	0.02187
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01379	0.01302	0.00929
	RN	-0.00162	-0.05477	-0.57257
	RN	0.02981	0.02906	0.02497

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	0.01399	0.01209	-0.00477
	RN	0.02647	0.02490	0.00779
	SN	-0.00162	-0.07423	-0.95035
	SN	0.02903	0.02759	0.01098
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01275	0.01092	-0.00025
	RN	0.02522	0.02373	0.01221
	SN	-0.00162	-0.05477	-0.57254
	SN	0.02777	0.02643	0.01519

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	-0.00384	-0.00396	-0.00396
	(!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)	0.01721	0.01658	0.01620
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00674	0.00616	0.00584
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00670	0.00610	0.00579
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00678	0.00620	0.00587
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00384	-0.00396	-0.00396
	(!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)	0.01721	0.01658	0.01620
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00674	0.00616	0.00583
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00670	0.00610	0.00579
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00678	0.00620	0.00587

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	0.00394	0.00398	0.00396
	(!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)	0.02619	0.02583	0.02540
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01147	0.01122	0.01114
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01151	0.01129	0.01119
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01142	0.01119	0.01110
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00394	0.00398	0.00396
	(!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)	0.02618	0.02582	0.02539
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01146	0.01121	0.01113
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01150	0.01125	0.01118
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01141	0.01118	0.01109

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)	0.00437	0.00362	0.00328
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01525	0.01423	0.01362
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)	0.00437	0.00362	0.00328
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01525	0.01423	0.01362

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)	0.01154	0.01116	0.01119
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02421	0.02330	0.02286
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)	0.01153	0.01114	0.01118
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02419	0.02329	0.02285

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)	-0.00896	-0.00900	-0.00905
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00914	-0.00931	-0.00927
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00887	-0.00895	-0.00894
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00537	0.00470	0.00422
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)	-0.00896	-0.00901	-0.00905
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00913	-0.00929	-0.00925
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00887	-0.00895	-0.00893
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00538	0.00470	0.00423

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)	0.00902	0.00913	0.00908
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00921	0.00931	0.00927
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00891	0.00898	0.00894
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01820	0.01782	0.01779
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)	0.00902	0.00913	0.00908
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00920	0.00930	0.00925
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00890	0.00898	0.00894
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01819	0.01780	0.01779

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)	-0.00083	-0.00172	-0.00197
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00739	0.00595	0.00512
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00732	0.00586	0.00507
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00110	-0.00204	-0.00228
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00544	0.00368	0.00322
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00083	-0.00172	-0.00197
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00738	0.00594	0.00511
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00731	0.00585	0.00509
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00110	-0.00204	-0.00228
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00544	0.00368	0.00322

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)	0.03988	0.03873	0.03754
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01755	0.01710	0.01698
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02824	0.02743	0.02655
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02833	0.02759	0.02663
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03900	0.03779	0.03732
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01904	0.01862	0.01856
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02289	0.02195	0.02192
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03988	0.03873	0.03754
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01755	0.01710	0.01698
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02824	0.02744	0.02655
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02833	0.02759	0.02663
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03899	0.03778	0.03731
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01904	0.01862	0.01856
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02288	0.02195	0.02191

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00530	0.00904	0.01585	1.45708	1.45005
sky130_osu_sc_18T_ms__dffs_l	0.00530	0.00904	0.01585	0.88631	0.89885

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.00154	0.00177
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.00134	0.00157

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)	0.38992	1.74082	15.68150
	QN->Q (FR)	0.05398	1.08182	13.47480
	SN->Q (FR)	0.32261	1.85688	18.28090
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.39629	1.85668	14.45110
	QN->Q (FR)	0.06479	1.18046	13.07960
	SN->Q (FR)	0.32802	1.97190	16.99930

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)	0.55908	2.08000	18.17280
	QN->Q (RF)	0.03692	0.78978	9.88033
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.58027	2.28987	17.39910
	QN->Q (RF)	0.03868	0.78029	8.94572

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)	0.49597	1.30023	8.75138
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.50386	1.41368	8.77337

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)	0.31633	0.88344	5.35110
	SN->QN (FF)	0.24797	1.00115	7.94505
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.30856	0.87615	4.76294
	SN->QN (FF)	0.23934	0.99289	7.32058

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)	-0.06759	-0.09810	-0.60884
	setup	CK (R)	0.27498	0.29529	1.52185
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.06529	-0.09929	-0.61065
	setup	CK (R)	0.27728	0.29448	1.52414

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)	-0.22548	-0.62262	-7.02757
	setup	CK (R)	0.29700	0.64222	7.07162
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.22883	-0.62151	-7.02768
	setup	CK (R)	0.29281	0.64222	7.07121

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)	-0.06759	-0.09810	-0.60884
	setup	CK (R)	0.27498	0.29529	1.52185
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.06529	-0.09929	-0.61065
	setup	CK (R)	0.27728	0.29448	1.52414

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)	-0.22548	-0.62262	-7.02757
	setup	CK (R)	0.29700	0.64222	7.07162
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.22883	-0.62151	-7.02768
	setup	CK (R)	0.29281	0.64222	7.07121

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)	0.07046	0.11492	1.49355
	removal	CK (R)	-0.02403	-0.07524	-0.76531
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.07173	0.11397	1.39060
	removal	CK (R)	-0.02502	-0.07358	-0.76716

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)	0.07046	0.11492	1.49355
	removal	CK (R)	-0.02403	-0.07524	-0.76531
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.07173	0.11397	1.39060
	removal	CK (R)	-0.02502	-0.07358	-0.76716

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 ()	0.22842	0.67990	13.33370
	min_pulse_width	SN ()	0.23098	0.67990	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.22367	0.66470	13.33370
	min_pulse_width	SN ()	0.21745	0.66905	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 ()	0.15121	0.55176	13.33370
	min_pulse_width	CK ()	0.28541	0.55176	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.14295	0.55176	13.33370
	min_pulse_width	CK ()	0.27715	0.55176	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 ()	0.39615	0.56262	13.33370
	min_pulse_width	CK ()	0.25031	0.55176	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.39615	0.56262	13.33370
	min_pulse_width	CK ()	0.25031	0.55176	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	0.01136	0.00866	-0.00299
	SN	-0.00162	-0.07339	-0.93253
	SN	0.02491	0.02256	-0.00170
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01001	0.00806	-0.00321
	SN	-0.00162	-0.05446	-0.56724
	SN	0.02353	0.02197	0.01094

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	0.01315	0.01203	0.00299
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01178	0.01099	0.00736

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	0.01315	0.01204	0.00298
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01178	0.01099	0.00733

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	0.01133	0.00864	-0.00298
	SN	-0.00162	-0.07318	-0.92796
	SN	0.02487	0.02253	-0.00144
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00997	0.00804	-0.00286
	SN	-0.00162	-0.05493	-0.57522
	SN	0.02350	0.02192	0.01053

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	-0.00389	-0.00401	-0.00401
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01306	0.01239	0.01184
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00577	0.00519	0.00484
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00389	-0.00401	-0.00401
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01306	0.01239	0.01184
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00577	0.00519	0.00484

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	0.00399	0.00402	0.00401
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02281	0.02243	0.02213
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01098	0.01074	0.01065
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00399	0.00402	0.00401
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02281	0.02243	0.02213
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01098	0.01074	0.01065

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)	-0.00662	-0.00665	-0.00666
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00490	0.00435	0.00408
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)	-0.00662	-0.00665	-0.00666
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00490	0.00435	0.00408

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)	0.00664	0.00670	0.00667
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01282	0.01236	0.01223
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)	0.00664	0.00670	0.00667
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01283	0.01236	0.01223

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)	-0.00084	-0.00173	-0.00199
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00121	-0.00214	-0.00239
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00444	0.00265	0.00224
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00084	-0.00173	-0.00199
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00121	-0.00214	-0.00239
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00444	0.00265	0.00224

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)	0.03556	0.03436	0.03310
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01751	0.01706	0.01694
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03558	0.03431	0.03405
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01910	0.01865	0.01862
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02233	0.02134	0.02137
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03556	0.03436	0.03310
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01751	0.01706	0.01694
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03558	0.03432	0.03405
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01910	0.01865	0.01862
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02233	0.02135	0.02137

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00545	0.01570	1.49072	1.48975
sky130_osu_sc_18T_ms__dff_l	0.00545	0.01570	0.88905	0.89021

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.00158	0.00174
sky130_osu_sc_18T_ms__dff_l	0.00000	0.00139	0.00155

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)	0.31999	1.63471	15.36450
	QN->Q (FR)	0.05140	1.05966	13.28360
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.33894	1.80561	14.53300
	QN->Q (FR)	0.06580	1.19513	13.25100

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)	0.47621	1.96602	17.89680
	QN->Q (RF)	0.03364	0.74699	9.40158
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.51140	2.22902	17.49140
	QN->Q (RF)	0.03872	0.78070	8.95751

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)	0.41929	1.21101	8.67286
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.43699	1.34623	8.70839

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)	0.25377	0.80263	5.21245
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.25449	0.81611	4.70939

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)	-0.06238	-0.09749	-0.63799
	setup	CK (R)	0.20849	0.22648	1.50367
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.06487	-0.09761	-0.63613
	setup	CK (R)	0.20710	0.22495	1.49932

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)	-0.21426	-0.62060	-7.04795
	setup	CK (R)	0.25560	0.64307	7.12347
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.21405	-0.62285	-7.05133
	setup	CK (R)	0.25565	0.64301	7.12152

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 ()	0.12849	0.55176	13.33370
	min_pulse_width	CK ()	0.25857	0.55176	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.12436	0.55176	13.33370
	min_pulse_width	CK ()	0.25031	0.55176	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 ()**	0.32671	0.55176	13.33370
	min_pulse_width	**CK ()**	0.20282	0.55176	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.32464	0.55176	13.33370
	min_pulse_width	**CK ()**	0.20282	0.55176	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	0.01203	0.00991	-0.00471
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01078	0.00877	-0.00206

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	0.01342	0.01243	0.00471
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01220	0.01136	0.00736

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	0.01342	0.01244	0.00467
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01220	0.01137	0.00732

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	0.01199	0.00989	-0.00467
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01074	0.00873	-0.00210

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	-0.00376	-0.00396	-0.00395
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01238	0.01179	0.01139
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00376	-0.00396	-0.00395
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01238	0.01180	0.01140

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	0.00393	0.00397	0.00395
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02361	0.02317	0.02284
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00393	0.00397	0.00395
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02362	0.02317	0.02285

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)	-0.00085	-0.00174	-0.00199
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00120	-0.00213	-0.00238
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00085	-0.00174	-0.00199
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00120	-0.00213	-0.00238

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)	0.01745	0.01698	0.01688
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03493	0.03378	0.03265
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03622	0.03494	0.03460
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01902	0.01852	0.01854
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01745	0.01701	0.01688
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03494	0.03379	0.03265
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03622	0.03495	0.03460
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01902	0.01853	0.01854

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00539	1.48228
sky130_osu_sc_18T_ms__inv_10	0.05088	13.44530
sky130_osu_sc_18T_ms__inv_2	0.01037	2.88819
sky130_osu_sc_18T_ms__inv_3	0.01546	4.15151
sky130_osu_sc_18T_ms__inv_4	0.02047	5.67353
sky130_osu_sc_18T_ms__inv_6	0.03069	8.28572
sky130_osu_sc_18T_ms__inv_8	0.04079	10.90549
sky130_osu_sc_18T_ms__inv_l	0.00411	0.89112

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.00020	0.00036
sky130_osu_sc_18T_ms__inv_10	0.00000	0.00205	0.00358
sky130_osu_sc_18T_ms__inv_2	0.00000	0.00041	0.00072
sky130_osu_sc_18T_ms__inv_3	0.00000	0.00061	0.00107
sky130_osu_sc_18T_ms__inv_4	0.00000	0.00082	0.00143
sky130_osu_sc_18T_ms__inv_6	0.00000	0.00123	0.00215
sky130_osu_sc_18T_ms__inv_8	0.00000	0.00164	0.00286
sky130_osu_sc_18T_ms__inv_l	0.00000	0.00011	0.00016

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)**	0.04915	1.00198	12.53410
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.07284	0.71518	12.53740
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.03967	0.86817	12.43810
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.04389	0.81739	12.43650
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.04526	0.77614	12.53940
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.05165	0.74194	12.48040
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.06145	0.72131	12.48440
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.06224	1.13361	12.58890

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)**	0.03003	0.67913	8.53908
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.05013	0.49657	8.45746
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.02568	0.60418	8.46432
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.02813	0.57516	8.49504
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.02856	0.55084	8.54609
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.03586	0.52262	8.50879
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.04292	0.50757	8.49598
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.03421	0.70796	8.16076

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	0.00622	0.00573	0.00214
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05395	0.05475	0.02002
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01123	0.01124	0.01148
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01718	0.01713	0.01756
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02218	0.02083	0.02273
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03290	0.03309	0.03404
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04350	0.04399	0.04520
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00477	0.00468	0.00469

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	-0.00130	-0.00138	-0.00134
sky130_osu_sc_18T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.02286	-0.02167	-0.01906
sky130_osu_sc_18T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00411	-0.00411	-0.00393
sky130_osu_sc_18T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00552	-0.00547	-0.00518
sky130_osu_sc_18T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00853	-0.00842	-0.00777
sky130_osu_sc_18T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01297	-0.01287	-0.01162
sky130_osu_sc_18T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01783	-0.01703	-0.01543
sky130_osu_sc_18T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00090	-0.00097	-0.00098

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.80961	0.81530	0.01095	1.31554

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.00064	0.00107

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)	-	0.02908	0.66110	8.13825
	A1->Y (RR)	-	0.03101	0.66259	8.18990
	S0->Y (RR)	(!A0 * A1)	0.07546	0.73836	7.22316
	S0->Y (FR)	(A0 * !A1)	0.06862	0.84210	8.99352

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)	-	0.02432	0.59421	7.33044
	A1->Y (FF)	-	0.02285	0.59034	7.30141
	S0->Y (FF)	(!A0 * A1)	0.11310	0.75058	6.68047
	S0->Y (RF)	(A0 * !A1)	0.03526	0.63891	7.24598

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	-	-0.00632	-0.00632	-0.00634
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00443	-0.00444	-0.00444
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00767	0.00724	0.00742
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00425	-0.00504	-0.00519

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	-	0.00632	0.00632	0.00634
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00443	0.00444	0.00444
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00123	0.00050	0.00033
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01639	0.01598	0.01606

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)	-0.00169	-0.00168	-0.00168

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)	0.00169	0.00168	0.00168

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)	-0.00201	-0.00200	-0.00201

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)	0.00201	0.00200	0.00201

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)	-0.00154	-0.00227	-0.00245
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00149	-0.00229	-0.00243

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)	0.01244	0.01202	0.01210
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01162	0.01120	0.01133

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00541	0.00535	1.43834
sky130_osu_sc_18T_ms__nand2_l	0.00412	0.00408	0.88455

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.00022	0.00072
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.00013	0.00032

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)	0.05085	1.00100	12.43630
	B->Y (FR)	0.06028	1.00192	12.33770
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.06394	1.13744	12.56280
	B->Y (FR)	0.07592	1.14552	12.55960

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)	0.04311	0.82392	10.25550
	B->Y (RF)	0.04889	0.81559	9.98055
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.05108	0.89461	9.93859
	B->Y (RF)	0.05671	0.88246	9.64423

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	0.00662	0.00621	0.00662
	B	0.00000	0.00000	0.00000
	B	0.00819	0.00771	0.00815
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00502	0.00495	0.00257
	B	0.00000	0.00000	0.00000
	B	0.00614	0.00603	0.00603

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	-0.00086	-0.00099	-0.00097
	B	0.00000	0.00000	0.00000
	B	-0.00081	-0.00092	-0.00093
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00064	-0.00073	-0.00076
	B	0.00000	0.00000	0.00000
	B	-0.00062	-0.00069	-0.00071

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)	-0.00444	-0.00448	-0.00448
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00322	-0.00325	-0.00325

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)	0.00448	0.00452	0.00450
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00324	0.00327	0.00326

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)	-0.00415	-0.00417	-0.00417
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00300	-0.00303	-0.00302

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)	0.00415	0.00418	0.00418
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00300	0.00304	0.00302

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00536	0.00571	0.71488
sky130_osu_sc_18T_ms__nor2_l	0.00402	0.00439	0.41631

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.00022	0.00036
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.00012	0.00016

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)	0.11238	1.26787	12.80730
	B->Y (FR)	0.08962	1.20987	12.45390
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.14652	1.46908	12.79550
	B->Y (FR)	0.12532	1.41835	12.58060

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)	0.03767	0.58242	6.33730
	B->Y (RF)	0.03155	0.57173	6.31787
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.04101	0.60139	6.04277
	B->Y (RF)	0.03578	0.59264	6.02516

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	0.00844	0.00835	0.00804
	B	0.00000	0.00000	0.00000
	B	0.00677	0.00662	0.00662
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00613	0.00602	0.00600
	B	0.00000	0.00000	0.00000
	B	0.00511	0.00496	0.00492

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	0.00053	0.00021	0.00013
	B	0.00000	0.00000	0.00000
	B	-0.00110	-0.00117	-0.00125
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00032	0.00011	0.00003
	B	0.00000	0.00000	0.00000
	B	-0.00073	-0.00077	-0.00087

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)	-0.00378	-0.00400	-0.00397
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00266	-0.00280	-0.00280

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)	0.00394	0.00400	0.00397
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00277	0.00280	0.00280

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)	-0.00228	-0.00230	-0.00229
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00167	-0.00168	-0.00167

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)	0.00238	0.00240	0.00232
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00173	0.00175	0.00169

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00543	0.00544	0.00459	0.71715

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.00020	0.00052

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)	0.12273	1.25220	12.56350
	A1->Y (FR)	0.15145	1.31550	12.92160
	B0->Y (FR)	0.07847	1.06313	11.21520

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)	0.06024	0.70101	7.30986
	A1->Y (RF)	0.06855	0.69624	7.20699
	B0->Y (RF)	0.04795	0.71710	7.80097

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	0.00898	0.00876	0.00875
	A1	0.00000	0.00000	0.00000
	A1	0.01070	0.01054	0.01023
	B0	0.00728	0.00708	0.00713

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	0.00023	0.00012	0.00001
	A1	0.00000	0.00000	0.00000
	A1	0.00184	0.00156	0.00146
	B0	0.00267	0.00252	0.00245

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)	-0.00228	-0.00231	-0.00229
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00387	-0.00402	-0.00399
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00408	-0.00410	-0.00409

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)	0.00238	0.00240	0.00232
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00397	0.00402	0.00399
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00408	0.00410	0.00410

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)	-0.00373	-0.00392	-0.00391
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00385	-0.00398	-0.00397
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00404	-0.00406	-0.00405

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)	0.00388	0.00392	0.00391
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00394	0.00398	0.00397
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00404	0.00407	0.00406

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)	-0.00328	-0.00328	-0.00334

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)	0.00334	0.00340	0.00336

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00522	0.00554	0.00571	0.00555	0.72232

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.00035	0.00072

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)	0.16657	1.33233	12.95630
	A1->Y (FR)	0.14332	1.27223	12.60170
	B0->Y (FR)	0.09934	1.22649	12.56660
	B1->Y (FR)	0.12309	1.28641	12.90490

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)	0.09483	0.75281	7.45439
	A1->Y (RF)	0.07770	0.72669	7.37546
	B0->Y (RF)	0.06524	0.74136	7.85067
	B1->Y (RF)	0.08396	0.77716	8.03715

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	0.01363	0.01349	0.01264
	A1	0.01190	0.01167	0.01162
	B0	0.00898	0.00878	0.00876
	B1	0.01079	0.01065	0.00974

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00286	0.00261	0.00246
	A1	0.00136	0.00124	0.00109
	B0	0.00135	0.00121	0.00105
	B1	0.00289	0.00257	0.00244

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)	-0.00378	-0.00399	-0.00397
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00378	-0.00399	-0.00397
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00385	-0.00400	-0.00398
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00405	-0.00407	-0.00406

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)	0.00395	0.00399	0.00397
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00394	0.00399	0.00397
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00395	0.00400	0.00398
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00406	0.00410	0.00407

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)	-0.00227	-0.00229	-0.00228
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00227	-0.00229	-0.00228
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00382	-0.00395	-0.00395
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00404	-0.00406	-0.00405

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)	0.00236	0.00238	0.00231
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00236	0.00239	0.00231
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00393	0.00395	0.00395
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00404	0.00412	0.00406

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)	-0.00226	-0.00228	-0.00227
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00226	-0.00228	-0.00227
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00423	-0.00437	-0.00436
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00434	-0.00438	-0.00445

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)	0.00236	0.00237	0.00230
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00236	0.00238	0.00230
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00436	0.00437	0.00436
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00445	0.00453	0.00447

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)	-0.00373	-0.00394	-0.00392
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00373	-0.00389	-0.00392
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00432	-0.00445	-0.00443
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00440	-0.00442	-0.00450

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)	0.00389	0.00394	0.00392
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00389	0.00389	0.00392
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00442	0.00447	0.00443
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00451	0.00454	0.00452

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00569	0.00553	1.45911
sky130_osu_sc_18T_ms__or2_2	0.00569	0.00553	2.87986
sky130_osu_sc_18T_ms__or2_4	0.00569	0.00553	5.55486
sky130_osu_sc_18T_ms__or2_8	0.00569	0.00554	10.61835
sky130_osu_sc_18T_ms__or2_l	0.00442	0.00420	0.88807

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.00035	0.00046
sky130_osu_sc_18T_ms__or2_2	0.00000	0.00048	0.00082
sky130_osu_sc_18T_ms__or2_4	0.00000	0.00073	0.00153
sky130_osu_sc_18T_ms__or2_8	0.00000	0.00125	0.00297
sky130_osu_sc_18T_ms__or2_l	0.00000	0.00020	0.00026

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)	0.10043	0.88816	8.23158
	B->Y (RR)	0.09213	0.86016	8.04059
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.11022	0.80647	8.46885
	B->Y (RR)	0.10132	0.78243	8.32129
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.14580	0.79692	8.88246
	B->Y (RR)	0.13662	0.77892	8.79072
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.21342	0.84959	9.45048
	B->Y (RR)	0.20392	0.83649	9.35763
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.11904	1.03908	8.49700
	B->Y (RR)	0.11129	1.01473	8.34063

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)	0.21156	0.92702	7.66614
	B->Y (FF)	0.18049	0.86590	7.05780
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.26548	0.94441	7.99140
	B->Y (FF)	0.23486	0.88792	7.40729
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.38838	1.06028	8.51509
	B->Y (FF)	0.35799	1.00062	8.00950
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.63352	1.32370	9.14805
	B->Y (FF)	0.60273	1.26086	8.72738
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.26658	1.00967	7.46713
	B->Y (FF)	0.23211	0.95691	6.93696

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	0.00651	0.00575	0.00545
	B	0.00000	0.00000	0.00000
	B	0.00498	0.00429	0.00426
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01150	0.01103	0.01074
	B	0.00000	0.00000	0.00000
	B	0.00990	0.00963	0.00948
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02219	0.02233	0.02274
	B	0.00000	0.00000	0.00000
	B	0.02056	0.02116	0.02160
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04318	0.04442	0.04600
	B	0.00000	0.00000	0.00000
	B	0.04153	0.04346	0.04582
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00479	0.00422	0.00399
	B	0.00000	0.00000	0.00000
	B	0.00379	0.00332	0.00316

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	0.01391	0.01388	0.01381
	B	0.00000	0.00000	0.00000
	B	0.01193	0.01189	0.01203
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01696	0.01762	0.01769
	B	0.00000	0.00000	0.00000
	B	0.01499	0.01556	0.01579
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02449	0.02655	0.02691
	B	0.00000	0.00000	0.00000
	B	0.02258	0.02433	0.02496
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03947	0.04343	0.04536
	B	0.00000	0.00000	0.00000
	B	0.03746	0.04133	0.04321
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01051	0.01040	0.01034
	B	0.00000	0.00000	0.00000
	B	0.00913	0.00909	0.00908

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)	-0.00382	-0.00400	-0.00399
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00382	-0.00398	-0.00399
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00382	-0.00397	-0.00399
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00382	-0.00397	-0.00399
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00269	-0.00282	-0.00281

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)	0.00397	0.00400	0.00399
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00397	0.00398	0.00399
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00397	0.00397	0.00399
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00397	0.00397	0.00399
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00279	0.00282	0.00281

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)	-0.00229	-0.00231	-0.00230
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00231	-0.00230
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00231	-0.00230
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00229	-0.00231	-0.00230
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00169	-0.00171	-0.00170

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)	0.00239	0.00241	0.00233
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00239	0.00241	0.00233
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00239	0.00241	0.00233
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00239	0.00241	0.00233
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00177	0.00172

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00571	0.00720	0.71484
sky130_osu_sc_18T_ms__tbufi_l	0.00440	0.00555	0.41797

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.00024	0.00072
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.00014	0.00032

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)	0.08530	1.20546	12.44700
	OE->Y (FR)	0.07899	0.44776	4.68881
	OE->Y (RR)	0.13674	1.09194	8.36687
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.12027	1.41746	12.61530
	OE->Y (FR)	0.09416	0.48163	4.68867
	OE->Y (RR)	0.17114	1.31934	8.66469

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)	0.04156	0.67265	7.35257
	OE->Y (FF)	0.07914	0.44838	4.68896
	OE->Y (RF)	0.04090	0.65218	7.03338
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.04997	0.70879	7.05188
	OE->Y (FF)	0.09511	0.48244	4.68867
	OE->Y (RF)	0.04969	0.68984	6.72377

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	0.00632	0.00616	0.00615
	OE	0.00000	0.00000	0.00000
	OE	0.00596	0.00519	0.00529
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00480	0.00464	0.00457
	OE	0.00000	0.00000	0.00000
	OE	0.00427	0.00369	0.00360

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	-0.00111	-0.00117	-0.00125
	OE	0.00000	0.00000	0.00000
	OE	0.00431	0.00359	0.00345
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00073	-0.00077	-0.00087
	OE	0.00000	0.00000	0.00000
	OE	0.00303	0.00248	0.00235

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)	-0.00337	-0.00339	-0.00338
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00312	-0.00317	-0.00313
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00255	-0.00257	-0.00256
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00240	-0.00243	-0.00240

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)	0.00337	0.00339	0.00338
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00321	0.00323	0.00318
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00255	0.00257	0.00256
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00245	0.00247	0.00243

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)	0.00245	0.00173	0.00158
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00222	0.00148	0.00134
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00170	0.00114	0.00103
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00155	0.00097	0.00086

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)	0.00707	0.00659	0.00661
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00732	0.00679	0.00677
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00556	0.00515	0.00508
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00575	0.00529	0.00521

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.00571	0.00892	0.71236
sky130_osu_sc_18T_ms__tnbufi_l	0.00439	0.00663	0.41202

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.00034	0.00041
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.00018	0.00021

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)	0.08618	1.20392	12.42180
	OE->Y (RR)	0.03622	0.36882	4.69000
	OE->Y (FR)	0.10457	1.25854	12.75360
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.12119	1.40917	12.51270
	OE->Y (RR)	0.03905	0.36908	4.69037
	OE->Y (FR)	0.13556	1.45463	12.72580

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)	0.04097	0.67179	7.34111
	OE->Y (RF)	0.03603	0.36880	4.69001
	OE->Y (FF)	0.08776	0.72032	5.69701
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.04910	0.70716	7.00876
	OE->Y (RF)	0.03879	0.36908	4.69029
	OE->Y (FF)	0.10803	0.78321	5.57022

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	0.00648	0.00631	0.00630
	OE	0.00000	0.00000	0.00000
	OE	0.01535	0.01507	0.01433
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00495	0.00479	0.00473
	OE	0.00000	0.00000	0.00000
	OE	0.01137	0.01107	0.01115

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	-0.00130	-0.00135	-0.00143
	OE	0.00000	0.00000	0.00000
	OE	0.01390	0.01356	0.01384
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00091	-0.00095	-0.00106
	OE	0.00000	0.00000	0.00000
	OE	0.01028	0.01000	0.01005

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)	-0.00294	-0.00296	-0.00295
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00272	-0.00276	-0.00273
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00215	-0.00217	-0.00216
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00201	-0.00202	-0.00201

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)	0.00294	0.00296	0.00295
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00279	0.00281	0.00277
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00215	0.00217	0.00216
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00205	0.00206	0.00203

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)	-0.00492	-0.00594	-0.00607
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00471	-0.00584	-0.00601
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00342	-0.00416	-0.00426
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00328	-0.00406	-0.00422

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)	0.01186	0.01161	0.01176
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01165	0.01134	0.01155
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00881	0.00854	0.00858
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00867	0.00840	0.00844

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.01126	0.01024	0.71449

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.00069	0.00113

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	0.17508	1.14585	8.51754
	A->Y (FR)	!B	0.11560	1.23742	12.44110
	B->Y (RR)	A	0.14185	1.11005	8.42626
	B->Y (FR)	!A	0.14782	1.29864	12.78230

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	0.14605	0.82741	6.20696
	A->Y (RF)	!B	0.06207	0.68303	7.17721
	B->Y (FF)	A	0.13626	0.81881	6.20181
	B->Y (RF)	!A	0.07113	0.69478	7.18606

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	0.00558	0.00474	0.00457
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01551	0.01483	0.01493
	B	A	0.00000	0.00000	0.00000
	B	A	0.00236	0.00161	0.00149
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01667	0.01610	0.01571

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	0.01857	0.01768	0.01751
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00408	0.00326	0.00298
	B	A	0.00000	0.00000	0.00000
	B	A	0.01722	0.01700	0.01708
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00496	0.00398	0.00371

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.01123	0.01029	0.70966

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.00069	0.00087

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	0.17464	1.13383	8.43370
	A->Y (FR)	B	0.13118	1.28077	12.77880
	B->Y (RR)	!A	0.14573	1.11217	8.42503
	B->Y (FR)	A	0.14489	1.29761	12.77340

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	0.13672	0.80778	6.06958
	A->Y (RF)	B	0.05512	0.69109	7.34660
	B->Y (FF)	!A	0.12909	0.80109	6.04447
	B->Y (RF)	A	0.06522	0.67862	7.03045

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	0.01768	0.01714	0.01724
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00334	0.00184	0.00152
	B	A	0.00000	0.00000	0.00000
	B	A	0.01815	0.01768	0.01709
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00205	0.00128	0.00113

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	0.00330	0.00217	0.00186
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01929	0.01898	0.01908
	B	A	0.00000	0.00000	0.00000
	B	A	0.00332	0.00229	0.00200
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01753	0.01740	0.01748

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ss_1P60_-40C.ccs
Cell Library: Process , Voltage 1.60, 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	0.29375
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	154777.00000	309554.00000
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
	-0.00336	0.02826	0.38399

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
	2.69455	2.53051	0.50671