sky130_osu_sc_18T_ms_ff_1P76_-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_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.01928	0.01926	0.01473	3.57131	1.67512	3.43863
sky130_osu_sc_18T_ms__addf_l	0.01927	0.01925	0.01472	2.51972	1.67578	2.51851

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.22694	0.31955
sky130_osu_sc_18T_ms__addf_l	0.00000	0.14875	0.24137

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)	0.10499	1.49192	25.94880
	B->CO (RR)	0.09137	1.40990	24.52470
	CI->CO (RR)	0.09954	1.50898	26.27520
	CON->CO (FR)	0.02089	0.65132	10.84750
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.10518	1.39342	21.32200
	B->CO (RR)	0.09189	1.32412	20.33590
	CI->CO (RR)	0.09978	1.41186	21.69450
	CON->CO (FR)	0.02337	0.70305	10.87700

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)	0.13651	1.84258	31.83750
	B->CO (FF)	0.12023	1.74967	30.21460
	CI->CO (FF)	0.11825	1.80944	31.63410
	CON->CO (RF)	0.01908	0.57583	9.76323
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.13431	1.67218	25.40870
	B->CO (FF)	0.11858	1.59414	24.25660
	CI->CO (FF)	0.11600	1.64024	25.24190
	CON->CO (RF)	0.02032	0.59420	9.24214

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)	0.10355	0.83725	10.72300
	B->CON (FR)	0.08739	0.78642	10.25340
	CI->CON (FR)	0.08526	0.80550	10.61410
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.09892	0.83288	10.72100
	B->CON (FR)	0.08324	0.78272	10.25170
	CI->CON (FR)	0.08064	0.80112	10.61220

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)	0.06760	0.57827	7.41850
	B->CON (RF)	0.05446	0.55166	7.22102
	CI->CON (RF)	0.06215	0.60029	7.85652
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.06532	0.57594	7.41789
	B->CON (RF)	0.05248	0.54951	7.22047
	CI->CON (RF)	0.05986	0.59805	7.85592

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)	0.19905	1.60434	24.33510
	B->S (-R)	0.20196	1.57657	23.20050
	CI->S (-R)	0.17942	1.56837	24.14400
	CON->S (RR)	0.06111	0.51322	6.90426
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.19140	1.51091	20.77380
	B->S (-R)	0.19492	1.49462	19.99390
	CI->S (-R)	0.17175	1.47621	20.60560
	CON->S (RR)	0.06079	0.55564	6.97393

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)	0.16870	1.35817	20.03440
	B->S (-F)	0.16784	1.30491	19.14130
	CI->S (-F)	0.16255	1.37257	20.36600
	CON->S (FF)	0.07066	0.59869	7.64180
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.16151	1.26361	16.84970
	B->S (-F)	0.16084	1.22096	16.25920
	CI->S (-F)	0.15522	1.27883	17.21500
	CON->S (FF)	0.06870	0.61558	7.39902

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	0.00376	0.00480	0.03125
	B	0.00438	0.00526	0.02777
	CI	0.00585	0.00699	0.03365
sky130_osu_sc_18T_ms__addf_l	A	0.00293	0.00367	0.02135
	B	0.00357	0.00422	0.01914
	CI	0.00502	0.00584	0.02361

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01513	0.01602	0.05314
	B	0.01592	0.01660	0.04818
	CI	0.01276	0.01385	0.05270
sky130_osu_sc_18T_ms__addf_l	A	0.01432	0.01495	0.04112
	B	0.01509	0.01559	0.03792
	CI	0.01194	0.01281	0.04086

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01512	0.01550	0.03215
	B	0.01554	0.01604	0.03134
	CI	0.01394	0.01479	0.03082
sky130_osu_sc_18T_ms__addf_l	A	0.01431	0.01470	0.03181
	B	0.01474	0.01523	0.03059
	CI	0.01312	0.01396	0.03049

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00374	0.00439	0.01689
	B	0.00437	0.00488	0.01580
	CI	0.00507	0.00567	0.01724
sky130_osu_sc_18T_ms__addf_l	A	0.00291	0.00346	0.01542
	B	0.00356	0.00394	0.01443
	CI	0.00426	0.00476	0.01584

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01513	0.01600	0.05128
	B	0.01591	0.01659	0.04695
	CI	0.01276	0.01381	0.05069
sky130_osu_sc_18T_ms__addf_l	A	0.01432	0.01496	0.04112
	B	-0.00694	-0.00734	0.02185
	CI	0.01194	0.01281	0.04079

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.03407	0.03428	0.05332
	B	0.03010	0.03113	0.07406
	CI	0.02751	0.02747	0.04717
sky130_osu_sc_18T_ms__addf_l	A	0.03291	0.03299	0.05259
	B	0.02899	0.03005	0.07428
	CI	0.02637	0.02636	0.04684

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00943	0.01040	3.48079	1.83052	3.62428
sky130_osu_sc_18T_ms__addh_l	0.00943	0.01040	2.04805	1.81957	2.10432

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.27341	0.31947
sky130_osu_sc_18T_ms__addh_l	0.00000	0.27039	0.31705

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)	0.06968	0.50736	6.50036
	B->CO (RR)	0.07300	0.51404	6.66166
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.07057	0.57551	6.53672
	B->CO (RR)	0.07395	0.58337	6.64430

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)	0.06032	0.56947	7.60108
	B->CO (FF)	0.06521	0.58140	7.57556
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.06018	0.58917	6.87750
	B->CO (FF)	0.06488	0.60040	6.85338

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	0.09530	0.41598	3.38862
	A->CON (FR)	!B	0.05526	0.75799	10.50600
	B->CON (RR)	A	0.09862	0.42252	3.55231
	B->CON (FR)	!A	0.06980	0.79354	10.78790
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.08626	0.39628	3.38190
	A->CON (FR)	!B	0.04961	0.75028	10.46060
	B->CON (RR)	A	0.08961	0.40394	3.49137
	B->CON (FR)	!A	0.06411	0.78558	10.74150

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	0.09358	0.58586	6.10073
	A->CON (RF)	!B	0.03997	0.57537	7.97807
	B->CON (FF)	A	0.09346	0.62273	6.52083
	B->CON (RF)	!A	0.04594	0.55033	7.47554
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.08545	0.55874	5.90319
	A->CON (RF)	!B	0.03712	0.57087	7.94606
	B->CON (FF)	A	0.08525	0.59522	6.31106
	B->CON (RF)	!A	0.04323	0.54631	7.44531

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	0.07428	1.44751	25.78910
	A->S (FR)	B	0.12782	1.43833	23.57830
	B->S (RR)	!A	0.07989	1.37328	24.20890
	B->S (FR)	A	0.12851	1.52380	25.06780
	CON->S (FR)	-	0.02385	0.67961	11.35880
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.07436	1.30890	19.29710
	A->S (FR)	B	0.12270	1.28387	17.05560
	B->S (RR)	!A	0.08018	1.25182	18.29190
	B->S (FR)	A	0.12330	1.35227	17.97070
	CON->S (FR)	-	0.02710	0.75805	11.23910

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	0.08328	1.65236	29.47460
	A->S (RF)	B	0.12027	1.09013	17.17490
	B->S (FF)	!A	0.09781	1.69191	29.84970
	B->S (RF)	A	0.12356	1.09472	17.33490
	CON->S (RF)	-	0.01768	0.56166	9.51840
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.08010	1.42384	20.98430
	A->S (RF)	B	0.11306	0.94911	11.90300
	B->S (FF)	!A	0.09458	1.46090	21.28800
	B->S (RF)	A	0.11640	0.95616	12.00800
	CON->S (RF)	-	0.01973	0.58363	8.72946

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	0.00708	0.00688	0.01486
	B	0.00000	0.00000	0.00000
	B	0.00642	0.00604	0.01876
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00589	0.00569	0.01883
	B	0.00000	0.00000	0.00000
	B	0.00522	0.00484	0.02080

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.01094	0.01130	0.03176
	B	0.00000	0.00000	0.00000
	B	0.01142	0.01244	0.03459
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00974	0.01006	0.02941
	B	0.00000	0.00000	0.00000
	B	0.01021	0.01106	0.03100

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	0.00708	0.00696	0.01694
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00963	0.01003	0.01519
	B	A	0.00000	0.00000	0.00000
	B	A	0.00642	0.00610	0.02095
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01072	0.01067	0.01227
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00588	0.00569	0.01861
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00881	0.00918	0.01418
	B	A	0.00000	0.00000	0.00000
	B	A	0.00522	0.00487	0.02091
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00990	0.00979	0.01128

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	0.01094	0.01129	0.03078
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00144	0.00162	0.00451
	B	A	0.00000	0.00000	0.00000
	B	A	0.01141	0.01238	0.03304
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00258	0.00257	0.00574
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00973	0.01003	0.02908
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00043	0.00048	0.00201
	B	A	0.00000	0.00000	0.00000
	B	A	0.01021	0.01105	0.03095
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00157	0.00151	0.00330

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	0.01095	0.01131	0.03216
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00146	0.00182	0.00695
	B	A	0.00000	0.00000	0.00000
	B	A	0.01142	0.01247	0.03499
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00261	0.00275	0.00685
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00974	0.01006	0.02972
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00044	0.00049	0.00216
	B	A	0.00000	0.00000	0.00000
	B	A	0.01022	0.01108	0.02984
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00158	0.00148	0.00296

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	0.00709	0.00687	0.01480
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00963	0.00999	0.01350
	B	A	0.00000	0.00000	0.00000
	B	A	0.00642	0.00626	0.01873
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01073	0.01076	0.01219
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00589	0.00568	0.01913
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00881	0.00915	0.01364
	B	A	0.00000	0.00000	0.00000
	B	A	0.00522	0.00484	0.02086
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00991	0.00985	0.01112

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00511	0.00520	3.56406
sky130_osu_sc_18T_ms__and2_2	0.00511	0.00521	6.75104
sky130_osu_sc_18T_ms__and2_4	0.00511	0.00522	12.65592
sky130_osu_sc_18T_ms__and2_6	0.00515	0.00522	18.62981
sky130_osu_sc_18T_ms__and2_8	0.00514	0.00524	23.52740
sky130_osu_sc_18T_ms__and2_l	0.00408	0.00418	2.52455

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.13309	0.21288
sky130_osu_sc_18T_ms__and2_2	0.00000	0.21291	0.21298
sky130_osu_sc_18T_ms__and2_4	0.00000	0.37255	0.42571
sky130_osu_sc_18T_ms__and2_6	0.00000	0.53219	0.63849
sky130_osu_sc_18T_ms__and2_8	0.00000	0.69183	0.85128
sky130_osu_sc_18T_ms__and2_l	0.00000	0.03538	0.05655

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)	0.05315	0.45405	6.59036
	B->Y (RR)	0.05723	0.46338	6.39539
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.06175	0.41504	6.52401
	B->Y (RR)	0.06580	0.42188	6.34307
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.08529	0.43099	6.64592
	B->Y (RR)	0.08932	0.43376	6.50813
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.10769	0.46446	6.85498
	B->Y (RR)	0.11164	0.46384	6.74839
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.13034	0.49968	6.93627
	B->Y (RR)	0.13437	0.49623	6.84274
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.05847	0.51839	6.74575
	B->Y (RR)	0.06272	0.52577	6.59353

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)	0.04754	0.50854	7.10730
	B->Y (FF)	0.05036	0.51961	7.10930
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.05312	0.46753	6.95737
	B->Y (FF)	0.05654	0.47737	6.97886
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.07134	0.47786	7.01820
	B->Y (FF)	0.07480	0.48636	7.04861
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.09239	0.50802	7.16222
	B->Y (FF)	0.09573	0.51476	7.19422
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.11127	0.53288	7.03473
	B->Y (FF)	0.11471	0.53907	7.06871
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.05130	0.54197	6.81742
	B->Y (FF)	0.05493	0.55562	6.84385

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	0.00506	0.00549	0.06358
	B	0.00000	0.00000	0.00000
	B	0.00515	0.00481	0.03670
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01028	0.01074	0.06724
	B	0.00000	0.00000	0.00000
	B	0.01037	0.01037	0.04078
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02172	0.02287	0.07401
	B	0.00000	0.00000	0.00000
	B	0.02182	0.02262	0.04875
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03386	0.03524	0.08110
	B	0.00000	0.00000	0.00000
	B	0.03398	0.03471	0.05598
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04652	0.04699	0.08894
	B	0.00000	0.00000	0.00000
	B	0.04659	0.04692	0.06646
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00377	0.00450	0.05162
	B	0.00000	0.00000	0.00000
	B	0.00388	0.00381	0.03300

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	0.01320	0.01618	0.06842
	B	0.00000	0.00000	0.00000
	B	0.01495	0.01746	0.06647
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01695	0.02028	0.07225
	B	0.00000	0.00000	0.00000
	B	0.01877	0.02146	0.07054
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02657	0.03038	0.08216
	B	0.00000	0.00000	0.00000
	B	0.02834	0.03135	0.07996
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03605	0.04090	0.09232
	B	0.00000	0.00000	0.00000
	B	0.03772	0.04133	0.08942
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04688	0.05057	0.10212
	B	0.00000	0.00000	0.00000
	B	0.04851	0.05084	0.09829
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01052	0.01276	0.05222
	B	0.00000	0.00000	0.00000
	B	0.01184	0.01377	0.05093

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)	-0.00492	-0.00494	-0.00495
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00492	-0.00494	-0.00495
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00491	-0.00495	-0.00495
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00494	-0.00497	-0.00497
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00490	-0.00494	-0.00495
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00378	-0.00379	-0.00380

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)	0.00494	0.00496	0.00497
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00495	0.00496	0.00497
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00495	0.00496	0.00497
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00498	0.00499	0.00500
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00495	0.00496	0.00498
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00379	0.00379	0.00381

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)	-0.00460	-0.00461	-0.00462
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00460	-0.00462	-0.00462
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00460	-0.00464	-0.00462
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00460	-0.00462	-0.00462
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00460	-0.00461	-0.00461
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00355	-0.00355	-0.00355

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)	0.00464	0.00464	0.00463
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00464	0.00464	0.00464
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00464	0.00464	0.00464
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00464	0.00464	0.00464
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00464	0.00464	0.00464
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00356	0.00362	0.00356

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00483	0.00503	0.00487	1.64706

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.04680	0.10639

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)	0.05694	0.78791	10.60850
	A1->Y (FR)	0.04830	0.74743	10.15420
	B0->Y (FR)	0.04141	0.76258	10.48950

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)	0.03666	0.51729	6.91938
	A1->Y (RF)	0.03261	0.51834	7.00783
	B0->Y (RF)	0.02332	0.51787	7.16203

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	0.01176	0.01165	0.01445
	A1	0.00000	0.00000	0.00000
	A1	0.00978	0.00969	0.01240
	B0	0.00704	0.00761	0.01772

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	0.00246	0.00209	0.00329
	A1	0.00000	0.00000	0.00000
	A1	0.00249	0.00219	0.00399
	B0	-0.00126	-0.00122	0.00050

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)	-0.00385	-0.00428	-0.00428
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00432	-0.00437	-0.00434
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00433	-0.00437	-0.00434

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)	0.00426	0.00429	0.00428
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00433	0.00440	0.00435
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00436	0.00440	0.00435

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	-0.00423	-0.00423
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00427	-0.00430	-0.00428
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00468	-0.00472	-0.00471

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)	0.00420	0.00423	0.00423
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00427	0.00430	0.00429
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00470	0.00475	0.00473

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)	-0.00207	-0.00208	-0.00208

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)	0.00224	0.00225	0.00212

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00484	0.00504	0.00520	0.00496	1.56712

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.05072	0.21279

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)	0.07256	0.80792	10.51990
	A1->Y (FR)	0.06413	0.78312	10.29630
	B0->Y (FR)	0.04325	0.75206	10.19250
	B1->Y (FR)	0.05184	0.77891	10.49860

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)	0.04723	0.52126	6.72090
	A1->Y (RF)	0.04325	0.52169	6.80945
	B0->Y (RF)	0.02466	0.49923	6.79786
	B1->Y (RF)	0.02878	0.49885	6.70998

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	0.01430	0.01419	0.01685
	A1	0.01233	0.01220	0.01502
	B0	0.00764	0.00829	0.02028
	B1	0.00960	0.01020	0.02201

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00507	0.00468	0.00589
	A1	0.00512	0.00477	0.00667
	B0	-0.00084	-0.00086	0.00119
	B1	-0.00069	-0.00083	0.00050

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)	-0.00391	-0.00425	-0.00428
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00432	-0.00434	-0.00434
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00432	-0.00434	-0.00434
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00432	-0.00433	-0.00434

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)	0.00425	0.00433	0.00428
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00433	0.00440	0.00435
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00435	0.00440	0.00435
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00435	0.00440	0.00435

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)	-0.00387	-0.00421	-0.00422
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00427	-0.00430	-0.00428
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00467	-0.00472	-0.00471
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00467	-0.00471	-0.00471

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)	0.00420	0.00424	0.00422
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00428	0.00430	0.00430
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00469	0.00473	0.00472
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00469	0.00473	0.00472

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)	-0.00208	-0.00209	-0.00209
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00208	-0.00208	-0.00208
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00481	-0.00480	-0.00484
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00481	-0.00482	-0.00484

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)	0.00232	0.00233	0.00215
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00208	0.00208	0.00208
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00483	0.00486	0.00485
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00483	0.00486	0.00485

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)	-0.00209	-0.00210	-0.00210
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00209	-0.00210	-0.00210
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00440	-0.00442	-0.00441
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00440	-0.00442	-0.00441

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)	0.00233	0.00234	0.00216
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00209	0.00210	0.00210
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00443	0.00442	0.00442
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00443	0.00442	0.00442

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00522	3.53898
sky130_osu_sc_18T_ms__buf_2	0.00522	6.74409
sky130_osu_sc_18T_ms__buf_4	0.00522	12.84056
sky130_osu_sc_18T_ms__buf_6	0.00096	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00524	24.36878
sky130_osu_sc_18T_ms__buf_l	0.00423	2.53730

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.10649	0.10649
sky130_osu_sc_18T_ms__buf_2	0.00000	0.15974	0.21288
sky130_osu_sc_18T_ms__buf_4	0.00000	0.26623	0.42567
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.47921	0.85125
sky130_osu_sc_18T_ms__buf_l	0.00000	0.02831	0.02831

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)**	0.04344	0.43211	6.32249
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.04912	0.38485	6.23442
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.06675	0.39154	6.41576
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.10021	0.44608	6.75810
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.04820	0.49475	6.53194

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)**	0.04520	0.50002	7.05857
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.05140	0.46341	6.99156
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.06966	0.47579	7.11121
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.10940	0.53297	7.24229
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.04957	0.53767	6.85964

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	0.00467	0.00498	0.04196
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00988	0.01041	0.04714
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02117	0.02224	0.05640
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04471	0.04634	0.09359
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00360	0.00426	0.03939

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	0.01263	0.01545	0.06630
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01641	0.01942	0.07021
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02600	0.02938	0.07962
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04643	0.04927	0.09845
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01017	0.01237	0.05134

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
	-0.00072	-0.00073	-0.00072

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
	0.00072	0.00073	0.00072

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00499	0.00494	0.01441	3.38715	3.38102
sky130_osu_sc_18T_ms__dffr_l	0.00499	0.00494	0.01439	2.52590	2.52467

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.29539	0.48578
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.21721	0.40760

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)	0.19285	1.11748	16.02280
	QN->Q (FR)	0.02508	0.74861	12.41910
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.19029	1.20428	15.80350
	QN->Q (FR)	0.02614	0.77439	12.03590

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)	0.20651	1.13725	16.20820
	QN->Q (RF)	0.02248	0.68544	11.43280
	RN->Q (FF)	0.15449	1.19859	17.69450
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.20828	1.23958	16.12690
	QN->Q (RF)	0.02270	0.68756	10.70880
	RN->Q (FF)	0.15648	1.29968	17.61040

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)	0.18172	0.59293	6.26031
	RN->QN (FR)	0.12971	0.65340	7.74407
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.18145	0.64256	6.41557
	RN->QN (FR)	0.12962	0.70244	7.89236

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)**	0.16198	0.55208	5.74875
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.15712	0.57278	5.56922

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)	-0.03741	-0.06094	-0.06643
	setup	CK (R)	0.15222	0.20141	0.61949
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.03840	-0.05962	-0.06863
	setup	CK (R)	0.15199	0.20207	0.61709

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)	-0.07843	-0.29991	-2.86533
	setup	CK (R)	0.10524	0.31410	3.45379
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.08120	-0.29990	-2.93159
	setup	CK (R)	0.10524	0.31410	3.45360

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)	-0.03741	-0.06094	-0.06643
	setup	CK (R)	0.15222	0.20141	0.61949
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.03840	-0.05962	-0.06863
	setup	CK (R)	0.15199	0.20207	0.61709

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)	-0.07843	-0.29991	-2.86533
	setup	CK (R)	0.10524	0.31410	3.45379
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.08120	-0.29990	-2.93159
	setup	CK (R)	0.10524	0.31410	3.45360

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)	0.12569	0.16868	0.90226
	removal	CK (R)	-0.01979	-0.02386	-0.08107
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.12608	0.16927	0.89806
	removal	CK (R)	-0.01979	-0.02386	-0.08107

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)	0.12569	0.16868	0.90226
	removal	CK (R)	-0.01979	-0.02386	-0.08107
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.12608	0.16927	0.89806
	removal	CK (R)	-0.01979	-0.02386	-0.08107

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 ()	0.09259	0.47730	13.33370
	min_pulse_width	RN ()	0.09259	0.47730	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.08900	0.47730	13.33370
	min_pulse_width	RN ()	0.08900	0.47730	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 ()	0.08540	0.47730	13.33370
	min_pulse_width	CK ()	0.10697	0.47730	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.08181	0.47730	13.33370
	min_pulse_width	CK ()	0.10338	0.47730	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 ()	0.19686	0.47730	13.33370
	min_pulse_width	CK ()	0.08540	0.47730	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.19686	0.47730	13.33370
	min_pulse_width	CK ()	0.08540	0.47730	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	0.01297	0.00741	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01165	0.00795	-0.00530

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	0.01470	0.01112	0.00000
	RN	-0.00170	-0.13920	-2.62299
	RN	0.03417	0.03146	0.00154
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01338	0.01097	0.00530
	RN	-0.00170	-0.11673	-1.95605
	RN	0.03283	0.03123	0.02816

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	0.01470	0.01112	0.00000
	RN	-0.00170	-0.13905	-2.61769
	RN	0.03415	0.03141	0.00288
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01338	0.01096	0.00529
	RN	-0.00170	-0.11670	-1.95497
	RN	0.03282	0.03124	0.02865

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	0.01292	0.00744	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01161	0.00802	-0.00529

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	-0.00368	-0.00423	-0.00426
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01646	0.01576	0.03840
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00722	0.00664	0.02947
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00368	-0.00423	-0.00426
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01646	0.01576	0.03839
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00722	0.00664	0.02947

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	0.00422	0.00427	0.00426
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02623	0.02605	0.05123
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01236	0.01224	0.03660
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00422	0.00427	0.00426
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02623	0.02605	0.05123
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01235	0.01224	0.03660

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)	0.00505	0.00536	0.06766
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01453	0.01451	0.07863
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)	0.00505	0.00536	0.06766
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01453	0.01449	0.07863

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)	0.01213	0.01465	0.07892
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02556	0.02784	0.09369
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)	0.01213	0.01465	0.07892
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02556	0.02784	0.09369

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00090	0.06083
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00784	0.00674	0.07170
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00151	-0.00118	0.05971
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00098	-0.00090	0.06083
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00784	0.00674	0.07170
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00151	-0.00118	0.05971

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)	0.01854	0.02126	0.08526
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04069	0.04197	0.11736
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03085	0.03268	0.09807
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03950	0.04401	0.15336
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02080	0.02333	0.08650
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01854	0.02130	0.08526
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.04069	0.04197	0.11736
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.03085	0.03268	0.09807
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03950	0.04401	0.15336
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02079	0.02333	0.08650

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00494	0.00495	0.01069	0.01477	3.59849	3.58888
sky130_osu_sc_18T_ms__dffsr_l	0.00494	0.00495	0.01068	0.01477	2.55382	2.53423

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.34605	0.48590
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.26787	0.40772

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)	0.20559	1.12205	16.15410
	QN->Q (FR)	0.02363	0.72654	12.21950
	RN->Q (RR)	0.16608	1.09192	16.16200
	SN->Q (FR)	0.15126	1.22075	17.95130
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.20866	1.23762	16.04400
	QN->Q (FR)	0.02607	0.77443	12.07280
	RN->Q (RR)	0.16863	1.20666	16.04920
	SN->Q (FR)	0.15444	1.33275	17.83150

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)	0.23021	1.14786	16.31340
	QN->Q (RF)	0.02033	0.64238	10.84720
	RN->Q (FF)	0.15644	1.18909	17.77500
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.23547	1.27410	16.32830
	QN->Q (RF)	0.02265	0.69072	10.76710
	RN->Q (FF)	0.16122	1.31435	17.77970

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)	0.20646	0.61627	6.36046
	RN->QN (FR)	0.13294	0.65745	7.82192
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.20837	0.67242	6.46476
	RN->QN (FR)	0.13465	0.71293	7.91897

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)	0.17651	0.56854	5.83300
	RN->QN (RF)	0.13737	0.53907	5.84178
	SN->QN (FF)	0.12255	0.66657	7.62279
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.17587	0.60135	5.67740
	RN->QN (RF)	0.13713	0.57267	5.68540
	SN->QN (FF)	0.12214	0.69633	7.46163

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)	-0.04258	-0.06893	-0.10953
	setup	CK (R)	0.16067	0.20493	0.73189
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.04258	-0.06893	-0.10859
	setup	CK (R)	0.15736	0.20434	0.74449

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)	-0.08993	-0.31392	-2.30043
	setup	CK (R)	0.11844	0.32603	3.48833
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09018	-0.31391	-2.30798
	setup	CK (R)	0.11807	0.32603	3.48729

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)	-0.04258	-0.06893	-0.10953
	setup	CK (R)	0.16067	0.20493	0.73189
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.04258	-0.06893	-0.10859
	setup	CK (R)	0.15736	0.20434	0.74449

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)	-0.08993	-0.31392	-2.30043
	setup	CK (R)	0.11844	0.32603	3.48833
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.09018	-0.31391	-2.30798
	setup	CK (R)	0.11807	0.32603	3.48729

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)	0.12082	0.15959	0.95590
	removal	CK (R)	-0.01362	-0.01988	-0.06856
	hold	SN (R)	-0.11697	-0.26639	-1.31925
	setup	SN (R)	0.13670	0.32223	5.24007
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.12077	0.15906	0.95828
	removal	CK (R)	-0.01362	-0.01988	-0.06856
	hold	SN (R)	-0.11531	-0.26242	-1.30381
	setup	SN (R)	0.13586	0.31808	5.12437

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)	0.12082	0.15959	0.95590
	removal	CK (R)	-0.01362	-0.01988	-0.06856
	hold	SN (R)	-0.11697	-0.26639	-1.31925
	hold	SN (R)	-0.11756	-0.26639	-1.32217
	setup	SN (R)	0.13670	0.32079	4.96923
	setup	SN (R)	0.13450	0.32223	5.24007
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.12077	0.15906	0.95828
	removal	CK (R)	-0.01362	-0.01988	-0.06856
	hold	SN (R)	-0.11531	-0.26242	-1.30781
	hold	SN (R)	-0.11645	-0.26242	-1.30381
	setup	SN (R)	0.13586	0.31808	4.86014
	setup	SN (R)	0.12850	0.31808	5.12437

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 ()	0.10338	0.47730	13.33370
	min_pulse_width	RN ()	0.10338	0.47730	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.10338	0.47730	13.33370
	min_pulse_width	RN ()	0.09978	0.47730	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)	0.03054	0.06931	5.23476
	removal	CK (R)	-0.01137	-0.05169	-0.18149
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.03032	0.06891	5.18927
	removal	CK (R)	-0.01137	-0.05169	-0.18149

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)	0.03054	0.06931	5.23476
	removal	CK (R)	-0.01137	-0.05169	-0.18149
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.03032	0.06891	5.18927
	removal	CK (R)	-0.01137	-0.05169	-0.18149

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 ()	0.12136	0.47730	13.33370
	min_pulse_width	SN ()	0.12136	0.47730	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.12136	0.47730	13.33370
	min_pulse_width	SN ()	0.11416	0.47730	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 ()	0.09259	0.47730	13.33370
	min_pulse_width	CK ()	0.12136	0.47730	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.08900	0.47730	13.33370
	min_pulse_width	CK ()	0.11776	0.47730	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 ()	0.20405	0.47730	13.33370
	min_pulse_width	CK ()	0.09978	0.47730	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.20405	0.47730	13.33370
	min_pulse_width	CK ()	0.09978	0.47730	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	0.01613	0.01245	0.00000
	RN	0.02962	0.02563	-0.00895
	SN	-0.00170	-0.14435	-2.78667
	SN	0.03297	0.02851	-0.03025
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01494	0.01128	-0.00831
	RN	0.02842	0.02441	-0.00680
	SN	-0.00170	-0.11751	-1.97768
	SN	0.03176	0.02727	-0.02098

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	0.01702	0.01398	0.00000
	RN	-0.00170	-0.14435	-2.78667
	RN	0.03504	0.03267	0.00928
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01583	0.01357	0.00831
	RN	-0.00170	-0.11751	-1.97767
	RN	0.03384	0.03222	0.02923

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	0.01700	0.01397	0.00000
	RN	-0.00170	-0.14412	-2.77903
	RN	0.03501	0.03263	0.00963
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01582	0.01356	0.00863
	RN	-0.00170	-0.11696	-1.96237
	RN	0.03381	0.03220	0.02969

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	0.01607	0.01248	0.00000
	RN	0.02957	0.02565	-0.00920
	SN	-0.00170	-0.14412	-2.77913
	SN	0.03292	0.02845	-0.02884
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01489	0.01125	-0.00863
	RN	0.02837	0.02444	-0.00834
	SN	-0.00170	-0.11696	-1.96242
	SN	0.03172	0.02725	-0.01828

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	-0.00414	-0.00425	-0.00425
	(!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)	0.02064	0.01995	0.04227
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00787	0.00734	0.02983
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00786	0.00730	0.02982
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00792	0.00739	0.02988
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00414	-0.00425	-0.00425
	(!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)	0.02064	0.01995	0.04227
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00787	0.00734	0.02983
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00786	0.00730	0.02982
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00792	0.00739	0.02989

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	0.00424	0.00426	0.00425
	(!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)	0.02979	0.02949	0.05340
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01302	0.01298	0.03704
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01313	0.01308	0.03706
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01296	0.01293	0.03700
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00424	0.00426	0.00425
	(!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)	0.02978	0.02950	0.05339
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01300	0.01297	0.03703
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01312	0.01307	0.03705
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01295	0.01292	0.03699

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)	0.00395	0.00422	0.06650
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01698	0.01679	0.08093
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)	0.00395	0.00422	0.06651
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01698	0.01680	0.08096

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)	0.01295	0.01574	0.08023
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02682	0.02906	0.09422
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)	0.01294	0.01572	0.08022
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02681	0.02905	0.09421

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)	-0.00976	-0.00985	-0.00982
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00936	-0.01007	-0.01007
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00930	-0.00970	-0.00965
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00658	0.00611	0.03104
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)	-0.00976	-0.00985	-0.00982
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00934	-0.01006	-0.01005
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00929	-0.00969	-0.00964
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00659	0.00612	0.03105

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)	0.00979	0.00989	0.00986
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01003	0.01012	0.01009
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00963	0.00972	0.00967
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02092	0.02055	0.04461
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)	0.00979	0.00989	0.00986
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01001	0.01009	0.01007
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00962	0.00972	0.00967
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02091	0.02054	0.04461

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00090	0.06086
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00886	0.00782	0.07266
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00870	0.00767	0.07259
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00126	-0.00092	0.05999
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00543	0.00633	0.12020
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00097	-0.00090	0.06086
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00884	0.00781	0.07265
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00869	0.00766	0.07258
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00127	-0.00092	0.05999
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00543	0.00633	0.12021

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)	0.04511	0.04633	0.12139
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01860	0.02133	0.08535
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03119	0.03303	0.09834
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03124	0.03287	0.09828
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04301	0.04715	0.15534
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02061	0.02315	0.08634
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02461	0.02932	0.14698
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04511	0.04634	0.12140
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01860	0.02133	0.08535
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.03119	0.03303	0.09834
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.03124	0.03287	0.09828
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04300	0.04714	0.15533
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.02061	0.02315	0.08634
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02460	0.02915	0.14697

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00497	0.00878	0.01455	3.43913	3.40079
sky130_osu_sc_18T_ms__dffs_l	0.00497	0.00878	0.01455	2.54056	2.54952

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.26251	0.37928
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.18433	0.30110

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)	0.15296	1.07552	16.12050
	QN->Q (FR)	0.02490	0.74514	12.40270
	SN->Q (FR)	0.11900	1.18067	17.58380
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.15302	1.16247	15.77400
	QN->Q (FR)	0.02598	0.76979	11.98450
	SN->Q (FR)	0.11937	1.26199	17.22430

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)	0.22240	1.16045	16.39740
	QN->Q (RF)	0.02229	0.68571	11.48020
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.22310	1.25724	16.18210
	QN->Q (RF)	0.02255	0.68622	10.69980

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)	0.19698	0.61054	6.26780
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.19572	0.66004	6.46193

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)	0.12462	0.50762	5.69653
	SN->QN (FF)	0.09045	0.61220	7.15425
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.12235	0.53324	5.54798
	SN->QN (FF)	0.08867	0.63309	6.99147

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)	-0.02874	-0.05169	-0.04273
	setup	CK (R)	0.11125	0.16538	0.56578
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.02913	-0.05169	-0.04298
	setup	CK (R)	0.11127	0.16528	0.56371

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)	-0.08012	-0.30218	-3.12547
	setup	CK (R)	0.11096	0.31410	3.46981
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08270	-0.30218	-3.24084
	setup	CK (R)	0.11096	0.31410	3.46992

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)	-0.02874	-0.05169	-0.04273
	setup	CK (R)	0.11125	0.16538	0.56578
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.02913	-0.05169	-0.04298
	setup	CK (R)	0.11127	0.16528	0.56371

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)	-0.08012	-0.30218	-3.12547
	setup	CK (R)	0.11096	0.31410	3.46981
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08270	-0.30218	-3.24084
	setup	CK (R)	0.11096	0.31410	3.46992

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)	0.03294	0.06362	3.98775
	removal	CK (R)	-0.01402	-0.04771	-0.44169
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03274	0.06362	3.83695
	removal	CK (R)	-0.01402	-0.04771	-0.44169

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)	0.03294	0.06362	3.98775
	removal	CK (R)	-0.01402	-0.04771	-0.44169
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03274	0.06362	3.83695
	removal	CK (R)	-0.01402	-0.04771	-0.44169

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 ()	0.07821	0.47730	13.33370
	min_pulse_width	SN ()	0.08181	0.47730	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.07821	0.47730	13.33370
	min_pulse_width	SN ()	0.07821	0.47730	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 ()	0.06383	0.47730	13.33370
	min_pulse_width	CK ()	0.11057	0.47730	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.06383	0.47730	13.33370
	min_pulse_width	CK ()	0.10697	0.47730	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 ()	0.15371	0.47730	13.33370
	min_pulse_width	CK ()	0.09259	0.47730	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.15371	0.47730	13.33370
	min_pulse_width	CK ()	0.09259	0.47730	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	0.01296	0.00744	0.00000
	SN	-0.00170	-0.14048	-2.66326
	SN	0.02367	0.01881	-0.04500
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01162	0.00803	-0.00759
	SN	-0.00170	-0.11714	-1.96741
	SN	0.02235	0.01938	-0.00141

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	0.01460	0.01121	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01328	0.01104	0.00759

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	0.01459	0.01124	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01328	0.01102	0.00725

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	0.01291	0.00728	0.00000
	SN	-0.00170	-0.13954	-2.63333
	SN	0.02363	0.01882	-0.04422
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01158	0.00799	-0.00725
	SN	-0.00170	-0.11739	-1.97427
	SN	0.02232	0.01935	-0.00176

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	-0.00419	-0.00430	-0.00430
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01580	0.01509	0.03883
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00701	0.00645	0.02930
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00420	-0.00430	-0.00430
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01580	0.01509	0.03883
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00701	0.00645	0.02930

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	0.00430	0.00431	0.00430
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02537	0.02508	0.04981
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01247	0.01245	0.03689
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00430	0.00431	0.00430
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02537	0.02508	0.04981
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01247	0.01247	0.03689

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)	-0.00753	-0.00759	-0.00757
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00497	0.00518	0.05063
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)	-0.00753	-0.00759	-0.00757
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00497	0.00518	0.05064

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)	0.00757	0.00760	0.00759
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01496	0.01600	0.06313
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)	0.00757	0.00760	0.00759
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01496	0.01600	0.06313

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)	-0.00100	-0.00091	0.06092
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00140	-0.00105	0.05995
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00452	0.00564	0.12035
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00100	-0.00091	0.06092
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00140	-0.00105	0.05995
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00452	0.00565	0.12035

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)	0.04016	0.04146	0.11757
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01855	0.02128	0.08537
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03851	0.04279	0.15209
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02068	0.02320	0.08648
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02396	0.02879	0.14710
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.04016	0.04147	0.11757
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01855	0.02128	0.08537
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03851	0.04279	0.15209
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02068	0.02320	0.08648
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02396	0.02879	0.14710

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00513	0.01428	3.66728	3.61916
sky130_osu_sc_18T_ms__dff_l	0.00513	0.01428	2.48240	2.48497

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.32353	0.42609
sky130_osu_sc_18T_ms__dff_l	0.00000	0.24534	0.34791

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)	0.13706	1.04753	16.25130
	QN->Q (FR)	0.02344	0.72693	12.28480
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.14230	1.14797	15.51930
	QN->Q (FR)	0.02657	0.78020	12.07360

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)	0.19186	1.11193	16.52540
	QN->Q (RF)	0.02022	0.64428	10.93370
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.19855	1.22593	15.95630
	QN->Q (RF)	0.02260	0.68112	10.54640

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)	0.16873	0.57402	6.33461
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.17183	0.63355	6.38854

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)	0.11076	0.48897	5.70762
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.11192	0.52006	5.39544

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)	-0.02714	-0.05169	-0.06977
	setup	CK (R)	0.09464	0.15201	0.56301
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.02999	-0.05169	-0.07025
	setup	CK (R)	0.09121	0.15093	0.56483

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)	-0.07258	-0.29701	-3.19948
	setup	CK (R)	0.09205	0.31013	3.44471
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.07290	-0.29711	-3.19934
	setup	CK (R)	0.09192	0.31013	3.44468

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 ()	0.06023	0.47730	13.33370
	min_pulse_width	CK ()	0.09978	0.47730	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.06023	0.47730	13.33370
	min_pulse_width	CK ()	0.09978	0.47730	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 ()**	0.13574	0.47730	13.33370
	min_pulse_width	**CK ()**	0.07102	0.47730	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.13574	0.47730	13.33370
	min_pulse_width	**CK ()**	0.07102	0.47730	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	0.01351	0.00986	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01231	0.00864	-0.00444

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	0.01482	0.01185	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01366	0.01121	0.00444

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	0.01481	0.01186	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01365	0.01120	0.00479

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	0.01347	0.00986	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01227	0.00874	-0.00479

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	-0.00369	-0.00421	-0.00425
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01434	0.01394	0.03784
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00369	-0.00422	-0.00425
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01435	0.01395	0.03785

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	0.00421	0.00427	0.00425
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02598	0.02582	0.05070
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00421	0.00427	0.00425
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02599	0.02582	0.05070

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)	-0.00101	-0.00091	0.06093
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00138	-0.00103	0.05998
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00101	-0.00091	0.06093
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00138	-0.00104	0.05998

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)	0.01848	0.02124	0.08530
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03881	0.04026	0.11675
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03901	0.04328	0.15305
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02057	0.02312	0.08639
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01847	0.02124	0.08530
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03882	0.04019	0.11676
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03901	0.04329	0.15306
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02057	0.02312	0.08639

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00499	3.40892
sky130_osu_sc_18T_ms__inv_10	0.04685	28.46157
sky130_osu_sc_18T_ms__inv_2	0.00956	6.43807
sky130_osu_sc_18T_ms__inv_3	0.01425	9.32460
sky130_osu_sc_18T_ms__inv_4	0.01885	12.54948
sky130_osu_sc_18T_ms__inv_6	0.02826	17.97336
sky130_osu_sc_18T_ms__inv_8	0.03757	23.85016
sky130_osu_sc_18T_ms__inv_l	0.00398	2.38879

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.05325	0.10639
sky130_osu_sc_18T_ms__inv_10	0.00000	0.53246	1.06394
sky130_osu_sc_18T_ms__inv_2	0.00000	0.10649	0.21279
sky130_osu_sc_18T_ms__inv_3	0.00000	0.15974	0.31918
sky130_osu_sc_18T_ms__inv_4	0.00000	0.21298	0.42557
sky130_osu_sc_18T_ms__inv_6	0.00000	0.31947	0.63836
sky130_osu_sc_18T_ms__inv_8	0.00000	0.42596	0.85115
sky130_osu_sc_18T_ms__inv_l	0.00000	0.01415	0.02824

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)**	0.02175	0.64658	10.65050
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.03800	0.45197	10.49540
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.01871	0.56193	10.43390
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.02122	0.53390	10.58750
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.02244	0.50660	10.56460
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.02643	0.47448	10.44730
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.03185	0.46089	10.54320
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.02427	0.69659	10.63730

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)**	0.01776	0.54708	9.10245
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.03194	0.33374	8.59631
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.01542	0.45915	8.85275
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.01725	0.42626	8.95790
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.01770	0.40019	8.95167
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.02264	0.36592	8.79698
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.02711	0.34835	8.82299
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.01969	0.58004	8.91156

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	0.00648	0.00751	0.01604
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05733	0.07303	0.16061
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01164	0.01452	0.03108
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01782	0.02150	0.04661
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02301	0.03005	0.06124
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03416	0.04575	0.09331
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04545	0.05793	0.12401
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00518	0.00585	0.01273

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	-0.00150	-0.00133	0.00006
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.02052	-0.02091	-0.00371
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00465	-0.00417	-0.00119
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00617	-0.00458	-0.00088
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00925	-0.00829	-0.00220
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.01410	-0.01245	-0.00300
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01829	-0.01512	-0.00358
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00114	-0.00091	0.00108

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.76314	0.76390	0.01015	0.78118

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.10770	0.11098

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)	-	0.01135	0.25473	2.96330
	A1->Y (RR)	-	0.01212	0.25419	2.96406
	S0->Y (RR)	(!A0 * A1)	0.03660	0.21904	1.30354
	S0->Y (FR)	(A0 * !A1)	0.03349	0.34613	3.49861

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)	-	0.01025	0.25393	2.94138
	A1->Y (FF)	-	0.01036	0.25281	2.93031
	S0->Y (FF)	(!A0 * A1)	0.04683	0.31650	2.62566
	S0->Y (RF)	(A0 * !A1)	0.02174	0.26135	2.43456

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	-	-0.00706	-0.00707	-0.00707
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00473	-0.00474	-0.00474
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00781	0.01124	0.07617
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00469	-0.00374	0.05977

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	-	0.00706	0.00707	0.00707
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00473	0.00474	0.00474
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00125	0.00245	0.06699
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01781	0.02110	0.08500

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)	-0.00177	-0.00176	-0.00176

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)	0.00177	0.00176	0.00176

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)	-0.00211	-0.00210	-0.00210

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)	0.00211	0.00210	0.00210

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)	-0.00176	-0.00067	0.06335
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00170	-0.00070	0.06360

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)	0.01338	0.01673	0.08073
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01226	0.01581	0.08042

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00501	0.00496	3.12746
sky130_osu_sc_18T_ms__nand2_l	0.00399	0.00396	2.18478

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.05327	0.21279
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.01418	0.05648

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)	0.02203	0.63648	10.24390
	B->Y (FR)	0.02612	0.63242	10.09680
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.02446	0.68124	10.16640
	B->Y (FR)	0.02955	0.68195	10.10530

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)	0.02332	0.63066	10.48870
	B->Y (RF)	0.02714	0.63697	10.47640
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.02601	0.67784	10.24580
	B->Y (RF)	0.02959	0.68147	10.22190

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	0.00691	0.00786	0.01589
	B	0.00000	0.00000	0.00000
	B	0.00892	0.00977	0.01788
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00547	0.00608	0.01260
	B	0.00000	0.00000	0.00000
	B	0.00698	0.00750	0.01383

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	-0.00102	-0.00097	0.00038
	B	0.00000	0.00000	0.00000
	B	-0.00095	-0.00098	-0.00010
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00084	-0.00071	0.00120
	B	0.00000	0.00000	0.00000
	B	-0.00080	-0.00080	0.00053

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)	-0.00483	-0.00485	-0.00486
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00368	-0.00369	-0.00370

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)	0.00486	0.00487	0.00488
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00369	0.00377	0.00371

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)	-0.00445	-0.00448	-0.00446
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00339	-0.00341	-0.00339

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)	0.00447	0.00448	0.00447
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00340	0.00341	0.00340

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00501	0.00531	1.83692
sky130_osu_sc_18T_ms__nor2_l	0.00391	0.00425	1.33138

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.03442	0.10639
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.00937	0.02824

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)	0.04231	0.76375	10.75440
	B->Y (FR)	0.03193	0.73344	10.46840
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.04583	0.80273	10.44740
	B->Y (FR)	0.03651	0.78963	10.43490

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)	0.02391	0.45168	6.31527
	B->Y (RF)	0.01886	0.44149	6.29652
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.02569	0.48355	6.29369
	B->Y (RF)	0.02078	0.47617	6.27801

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	0.00946	0.00943	0.01230
	B	0.00000	0.00000	0.00000
	B	0.00713	0.00783	0.01928
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00721	0.00683	0.01060
	B	0.00000	0.00000	0.00000
	B	0.00560	0.00578	0.01516

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	0.00094	0.00075	0.00269
	B	0.00000	0.00000	0.00000
	B	-0.00117	-0.00104	0.00087
sky130_osu_sc_18T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00061	0.00063	0.00348
	B	0.00000	0.00000	0.00000
	B	-0.00084	-0.00071	0.00217

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)	-0.00370	-0.00425	-0.00427
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00276	-0.00315	-0.00316

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00424	0.00428	0.00427
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00314	0.00318	0.00316

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)	-0.00208	-0.00209	-0.00209
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00155	-0.00155	-0.00155

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)	0.00217	0.00218	0.00212
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00161	0.00162	0.00157

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00504	0.00511	0.00442	1.81169

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.02784	0.13463

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)	0.04265	0.74670	10.48750
	A1->Y (FR)	0.05655	0.78157	10.77480
	B0->Y (FR)	0.02948	0.63830	9.05207

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)	0.03404	0.55839	7.78268
	A1->Y (RF)	0.03990	0.55264	7.57358
	B0->Y (RF)	0.02632	0.57787	8.21794

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	0.00991	0.01053	0.02009
	A1	0.00000	0.00000	0.00000
	A1	0.01225	0.01209	0.01472
	B0	0.00830	0.00905	0.01833

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	0.00029	0.00014	0.00126
	A1	0.00000	0.00000	0.00000
	A1	0.00238	0.00206	0.00316
	B0	0.00079	0.00086	0.00367

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)	-0.00208	-0.00213	-0.00209
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00419	-0.00431	-0.00429
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00435	-0.00439	-0.00436

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)	0.00218	0.00218	0.00212
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00426	0.00431	0.00429
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00435	0.00440	0.00437

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)	-0.00364	-0.00418	-0.00420
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00415	-0.00427	-0.00426
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00430	-0.00433	-0.00431

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)	0.00417	0.00418	0.00420
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00423	0.00427	0.00426
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00431	0.00436	0.00433

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)	-0.00376	-0.00379	-0.00382

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)	0.00381	0.00384	0.00383

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00489	0.00515	0.00531	0.00519	1.81640

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.05165	0.21279

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)	0.06089	0.78251	10.73210
	A1->Y (FR)	0.05054	0.75029	10.45140
	B0->Y (FR)	0.03618	0.73745	10.45700
	B1->Y (FR)	0.04674	0.76784	10.74310

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)	0.05781	0.59666	7.96772
	A1->Y (RF)	0.04604	0.57626	7.84463
	B0->Y (RF)	0.03807	0.59304	8.25162
	B1->Y (RF)	0.05098	0.62499	8.56682

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	0.01592	0.01578	0.01824
	A1	0.01359	0.01417	0.02354
	B0	0.00764	0.00846	0.01861
	B1	0.01247	0.01205	0.01486

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00389	0.00358	0.00458
	A1	-0.00042	-0.00056	0.00058
	B0	-0.00048	-0.00046	0.00127
	B1	0.00159	0.00133	0.00301

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)	-0.00369	-0.00425	-0.00427
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00369	-0.00425	-0.00427
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00415	-0.00428	-0.00427
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00432	-0.00434	-0.00433

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)	0.00424	0.00428	0.00427
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00424	0.00428	0.00427
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00424	0.00428	0.00427
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00432	0.00437	0.00434

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)	-0.00206	-0.00207	-0.00207
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00206	-0.00207	-0.00207
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00414	-0.00427	-0.00425
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00430	-0.00434	-0.00431

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)	0.00216	0.00217	0.00210
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00216	0.00217	0.00210
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00423	0.00429	0.00425
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00431	0.00435	0.00433

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)	-0.00205	-0.00207	-0.00206
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00205	-0.00207	-0.00206
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00466	-0.00479	-0.00477
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00474	-0.00478	-0.00482

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)	0.00214	0.00216	0.00209
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00214	0.00216	0.00209
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00480	0.00482	0.00477
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00482	0.00485	0.00484

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)	-0.00365	-0.00419	-0.00421
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00365	-0.00419	-0.00421
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00474	-0.00486	-0.00485
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00481	-0.00482	-0.00489

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)	0.00418	0.00422	0.00421
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00418	0.00422	0.00421
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00487	0.00492	0.00485
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00489	0.00491	0.00491

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00534	0.00513	3.49779
sky130_osu_sc_18T_ms__or2_2	0.00535	0.00513	6.72721
sky130_osu_sc_18T_ms__or2_4	0.00535	0.00514	12.76643
sky130_osu_sc_18T_ms__or2_8	0.00535	0.00517	23.54267
sky130_osu_sc_18T_ms__or2_l	0.00432	0.00407	2.45436

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.06109	0.10659
sky130_osu_sc_18T_ms__or2_2	0.00000	0.08776	0.21298
sky130_osu_sc_18T_ms__or2_4	0.00000	0.14111	0.42577
sky130_osu_sc_18T_ms__or2_8	0.00000	0.24779	0.85135
sky130_osu_sc_18T_ms__or2_l	0.00000	0.01649	0.02838

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)	0.05122	0.45773	6.07675
	B->Y (RR)	0.04489	0.43373	6.17182
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.05736	0.41133	6.12674
	B->Y (RR)	0.05083	0.39025	6.18434
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.07529	0.41465	6.38325
	B->Y (RR)	0.06870	0.39756	6.41091
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.10862	0.46211	6.66209
	B->Y (RR)	0.10205	0.44854	6.65913
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.05645	0.52026	6.29681
	B->Y (RR)	0.05013	0.49860	6.33829

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)	0.07685	0.57804	7.30163
	B->Y (FF)	0.06258	0.53770	7.27674
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.09011	0.55024	7.31611
	B->Y (FF)	0.07589	0.51341	7.22952
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.12398	0.57656	7.52200
	B->Y (FF)	0.10983	0.54564	7.36004
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.19491	0.65567	7.58532
	B->Y (FF)	0.18076	0.63096	7.35960
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.08311	0.59849	6.93809
	B->Y (FF)	0.06907	0.57279	7.00518

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	0.00711	0.00667	0.02622
	B	0.00000	0.00000	0.00000
	B	0.00517	0.00587	0.04199
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01236	0.01237	0.03319
	B	0.00000	0.00000	0.00000
	B	0.01033	0.01130	0.04685
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02367	0.02427	0.04504
	B	0.00000	0.00000	0.00000
	B	0.02156	0.02320	0.05608
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04731	0.04865	0.06776
	B	0.00000	0.00000	0.00000
	B	0.04526	0.04813	0.07595
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00537	0.00531	0.02619
	B	0.00000	0.00000	0.00000
	B	0.00408	0.00505	0.03775

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	0.01558	0.01561	0.03510
	B	0.00000	0.00000	0.00000
	B	0.01294	0.01556	0.06950
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01931	0.01984	0.03904
	B	0.00000	0.00000	0.00000
	B	0.01669	0.01981	0.07199
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02916	0.02991	0.04853
	B	0.00000	0.00000	0.00000
	B	0.02652	0.02954	0.07872
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05328	0.04966	0.06730
	B	0.00000	0.00000	0.00000
	B	0.05033	0.04973	0.09463
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01226	0.01238	0.03176
	B	0.00000	0.00000	0.00000
	B	0.01029	0.01229	0.05610

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00428	-0.00429
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00428	-0.00429
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00428	-0.00429
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00374	-0.00428	-0.00429
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00278	-0.00317	-0.00317

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)	0.00426	0.00428	0.00429
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00426	0.00428	0.00429
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00426	0.00429	0.00429
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00426	0.00429	0.00429
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00315	0.00320	0.00317

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)	-0.00208	-0.00214	-0.00209
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00209	-0.00214	-0.00209
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00209	-0.00214	-0.00210
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00209	-0.00214	-0.00210
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00157	-0.00161	-0.00158

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)	0.00219	0.00219	0.00213
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00219	0.00219	0.00213
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00219	0.00219	0.00213
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00219	0.00219	0.00213
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00165	0.00164	0.00160

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00531	0.00682	1.83362
sky130_osu_sc_18T_ms__tbufi_l	0.00426	0.00547	1.33534

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.05332	0.21279
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.01421	0.05648

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)	0.03064	0.73012	10.44860
	OE->Y (FR)	0.03623	0.35055	5.02023
	OE->Y (RR)	0.05741	0.53459	6.40308
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.03515	0.79094	10.47050
	OE->Y (FR)	0.03905	0.35035	5.02001
	OE->Y (RR)	0.06227	0.60850	6.53570

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)	0.02263	0.52409	7.48080
	OE->Y (FF)	0.03636	0.35052	5.02021
	OE->Y (RF)	0.02292	0.52106	7.39967
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.02561	0.56764	7.49735
	OE->Y (FF)	0.03936	0.35036	5.02002
	OE->Y (RF)	0.02616	0.56476	7.40712

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	0.00662	0.00751	0.01762
	OE	0.00000	0.00000	0.00000
	OE	0.00664	0.00758	0.05900
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00523	0.00537	0.01378
	OE	0.00000	0.00000	0.00000
	OE	0.00494	0.00622	0.05067

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	-0.00119	-0.00106	0.00067
	OE	0.00000	0.00000	0.00000
	OE	0.00443	0.00561	0.06913
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00085	-0.00071	0.00183
	OE	0.00000	0.00000	0.00000
	OE	0.00316	0.00457	0.05635

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)	-0.00348	-0.00351	-0.00350
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00308	-0.00314	-0.00310
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00271	-0.00274	-0.00272
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00243	-0.00246	-0.00244

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)	0.00348	0.00351	0.00350
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00316	0.00317	0.00314
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00271	0.00274	0.00272
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00248	0.00249	0.00246

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)	0.00255	0.00387	0.06927
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00232	0.00373	0.06907
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00179	0.00333	0.05673
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00161	0.00314	0.05656

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)	0.00775	0.01046	0.07618
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00772	0.01060	0.07629
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00630	0.00840	0.06165
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00632	0.00850	0.06170

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.00530	0.00816	1.83321
sky130_osu_sc_18T_ms__tnbufi_l	0.00425	0.00634	1.32469

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.08875	0.10649
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.02360	0.02831

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)	0.03078	0.73006	10.44700
	OE->Y (RR)	0.02316	0.35151	5.02117
	OE->Y (FR)	0.04053	0.76182	10.73810
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.03539	0.78841	10.41890
	OE->Y (RR)	0.02424	0.35182	5.02148
	OE->Y (FR)	0.04433	0.80197	10.42910

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)	0.02233	0.52396	7.47972
	OE->Y (RF)	0.02292	0.35151	5.02118
	OE->Y (FF)	0.04078	0.45226	5.44204
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.02524	0.56563	7.46072
	OE->Y (RF)	0.02406	0.35184	5.02156
	OE->Y (FF)	0.04576	0.48794	5.27862

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	0.00680	0.00768	0.01780
	OE	0.00000	0.00000	0.00000
	OE	0.01684	0.02052	0.08683
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00542	0.00555	0.01412
	OE	0.00000	0.00000	0.00000
	OE	0.01303	0.01540	0.06941

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00142	-0.00128	0.00045
	OE	0.00000	0.00000	0.00000
	OE	0.01493	0.01850	0.07632
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00107	-0.00094	0.00165
	OE	0.00000	0.00000	0.00000
	OE	0.01146	0.01419	0.05833

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)	-0.00296	-0.00299	-0.00298
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00260	-0.00265	-0.00261
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00221	-0.00223	-0.00222
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00196	-0.00197	-0.00197

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)	0.00296	0.00299	0.00298
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00266	0.00268	0.00265
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00221	0.00223	0.00222
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00200	0.00201	0.00198

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)	-0.00512	-0.00399	0.06217
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00512	-0.00387	0.06219
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00382	-0.00239	0.05148
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00380	-0.00236	0.05153

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)	0.01274	0.01700	0.08308
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01257	0.01673	0.08291
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00986	0.01294	0.06671
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00974	0.01291	0.06661

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.01047	0.00951	1.93986

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.17417	0.31928

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	0.07302	0.57789	6.78474
	A->Y (FR)	!B	0.03945	0.75039	10.73870
	B->Y (RR)	A	0.05820	0.55996	6.81826
	B->Y (FR)	!A	0.05637	0.78630	11.04930

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	0.06770	0.52490	6.06284
	A->Y (RF)	!B	0.03384	0.55716	7.91768
	B->Y (FF)	A	0.06044	0.51980	6.07612
	B->Y (RF)	!A	0.04145	0.56668	7.91182

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	0.00660	0.00714	0.05749
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01645	0.01959	0.09234
	B	A	0.00000	0.00000	0.00000
	B	A	0.00228	0.00347	0.06780
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01815	0.02087	0.08507

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	0.02067	0.02257	0.08538
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00451	0.00520	0.06721
	B	A	0.00000	0.00000	0.00000
	B	A	0.01875	0.02184	0.08718
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00607	0.00666	0.06850

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	0.01048	0.00956	1.87046

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.17417	0.27025

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	0.07016	0.55725	6.60428
	A->Y (FR)	B	0.05003	0.77628	10.91900
	B->Y (RR)	!A	0.06072	0.55472	6.63260
	B->Y (FR)	A	0.05435	0.77966	10.88780

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	0.06053	0.50503	5.60825
	A->Y (RF)	B	0.03108	0.54137	7.56734
	B->Y (FF)	!A	0.05511	0.49692	5.69577
	B->Y (RF)	A	0.03899	0.54264	7.49175

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	0.01943	0.02252	0.09027
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00352	0.00312	0.06640
	B	A	0.00000	0.00000	0.00000
	B	A	0.01998	0.02307	0.08921
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00197	0.00303	0.06800

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	0.00385	0.00455	0.07031
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02126	0.02436	0.08172
	B	A	0.00000	0.00000	0.00000
	B	A	0.00390	0.00445	0.06797
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01904	0.02251	0.08832

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ff_1P76_-40C.ccs
Cell Library: Process , Voltage 1.76, 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	1.06272
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	476687.00000	953373.00000
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
	-0.00124	0.12223	1.68330

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
	8.29362	7.87640	2.04352