

sky130_osu_sc_18T_ms_tt_1P80_150C.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_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.02238	0.02224	0.01693	2.98263	1.53030	3.05241
sky130_osu_sc_18T_ms__addf_l	0.02236	0.02222	0.01693	2.19174	1.53240	2.24725

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	324.33300	398.24100
sky130_osu_sc_18T_ms__addf_l	0.00000	274.62800	348.53500

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)	0.15660	1.75203	26.97700
	B->CO (RR)	0.15691	1.71073	26.01610
	CI->CO (RR)	0.14918	1.79969	27.70130
	CON->CO (FR)	0.02424	0.61999	9.34149
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.15790	1.67399	22.97820
	B->CO (RR)	0.15833	1.64176	22.37840
	CI->CO (RR)	0.15049	1.72206	23.71950
	CON->CO (FR)	0.02679	0.68631	9.64231

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)	0.17175	1.89782	29.41880
	B->CO (FF)	0.15251	1.84499	28.69040
	CI->CO (FF)	0.14993	1.91678	29.93160
	CON->CO (RF)	0.02798	0.71402	10.87190
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.16820	1.77421	24.46500
	B->CO (FF)	0.14926	1.73272	24.05010
	CI->CO (FF)	0.14634	1.79435	25.00600
	CON->CO (RF)	0.03020	0.76119	10.77830

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)	0.11753	0.75509	8.62593
	B->CON (FR)	0.10011	0.74740	8.77585
	CI->CON (FR)	0.09568	0.77717	9.21665
sky130_osu_sc_18T_ms__addf_1	A->CON (FR)	0.11170	0.74968	8.63118
	B->CON (FR)	0.09472	0.74248	8.77846
	CI->CON (FR)	0.08988	0.76928	9.21935

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)	0.11877	0.78454	9.02796
	B->CON (RF)	0.11958	0.79615	9.17662
	CI->CON (RF)	0.11133	0.83540	9.80009
sky130_osu_sc_18T_ms__addf_1	A->CON (RF)	0.11381	0.78008	9.03190
	B->CON (RF)	0.11499	0.79223	9.18006
	CI->CON (RF)	0.10636	0.83099	9.80419

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)	0.25136	1.70112	23.69070
	B->S (-R)	0.28082	1.71193	22.79100
	CI->S (-R)	0.22795	1.71711	24.20460
	CON->S (RR)	0.08222	0.61948	7.68500
sky130_osu_sc_18T_ms__addf_1	A->S (-R)	0.24116	1.58420	19.86080
	B->S (-R)	0.23518	1.56211	19.34510
	CI->S (-R)	0.21757	1.60104	20.39920
	CON->S (RR)	0.08179	0.65959	7.72269

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)	0.25396	1.73170	23.46360
	B->S (-F)	0.23571	1.64572	22.56900
	CI->S (-F)	0.24693	1.77867	24.20270
	CON->S (FF)	0.09609	0.65995	7.91667
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.24182	1.62879	19.97830
	B->S (-F)	0.23510	1.56687	19.41780
	CI->S (-F)	0.23460	1.67598	20.72780
	CON->S (FF)	0.09362	0.70082	7.91852

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	0.00987	0.01561	0.12402
	B	0.01103	0.01613	0.11434
	CI	0.01305	0.01898	0.12706
sky130_osu_sc_18T_ms__addf_1	A	0.00741	0.01173	0.08515
	B	0.00865	0.01245	0.07940
	CI	0.01059	0.01508	0.08828

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02549	0.03127	0.14902
	B	0.02572	0.03036	0.13623
	CI	0.02229	0.02858	0.14810
sky130_osu_sc_18T_ms__addf_1	A	0.02285	0.02740	0.11114
	B	0.02315	0.02682	0.10239
	CI	0.01964	0.02470	0.11039

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02312	0.02695	0.09358
	B	0.02296	0.02647	0.08884
	CI	0.01998	0.02430	0.09375
sky130_osu_sc_18T_ms__addf_1	A	0.02133	0.02500	0.08829
	B	0.02119	0.02455	0.08369
	CI	0.01818	0.02221	0.08821

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00802	0.01197	0.07365
	B	0.01044	0.01353	0.06919
	CI	0.01121	0.01535	0.07737
sky130_osu_sc_18T_ms__addf_1	A	0.00619	0.00974	0.06520
	B	0.00871	0.01141	0.06158
	CI	0.00938	0.01310	0.06884

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02420	0.03008	0.14988
	B	0.00292	0.00659	0.09891
	CI	0.02100	0.02739	0.14880
sky130_osu_sc_18T_ms__addf_1	A	0.00426	0.00408	0.12042
	B	-0.00036	0.00362	0.10452
	CI	0.01227	0.01525	0.12132

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.05400	0.05846	0.16445
	B	0.04586	0.05168	0.17069
	CI	0.04037	0.04506	0.14365
sky130_osu_sc_18T_ms__addf_1	A	0.05098	0.05563	0.16558
	B	0.04142	0.04780	0.16995
	CI	0.03741	0.04215	0.14474

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01092	0.01193	3.11947	1.60897	3.14940
sky130_osu_sc_18T_ms__addh_l	0.01092	0.01193	1.92076	1.61029	1.96278

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	351.16800	398.60800
sky130_osu_sc_18T_ms__addh_l	0.00000	281.64200	342.92200

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)	0.10132	0.65289	7.76978
	B->CO (RR)	0.10576	0.63492	7.80501
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.10072	0.71589	7.82463
	B->CO (RR)	0.10517	0.69882	7.78745

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)	0.08047	0.61162	7.75676
	B->CO (FF)	0.08638	0.62996	7.89748
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.08115	0.67830	7.57301
	B->CO (FF)	0.08685	0.69762	7.72328

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	0.13651	0.55542	4.65919
	A->CON (FR)	!B	0.06328	0.72222	8.99132
	B->CON (RR)	A	0.13981	0.53693	4.68903
	B->CON (FR)	!A	0.08135	0.70845	8.58346
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.12245	0.53364	4.68262
	A->CON (FR)	!B	0.05638	0.71491	8.98854
	B->CON (RR)	A	0.12585	0.51646	4.65235
	B->CON (FR)	!A	0.07447	0.70164	8.58097

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	0.13856	0.69001	6.48647
	A->CON (RF)	!B	0.06924	0.78895	9.83252
	B->CON (FF)	A	0.13246	0.72990	7.05237
	B->CON (RF)	!A	0.08495	0.77575	9.42715
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.12548	0.65688	6.30052
	A->CON (RF)	!B	0.06321	0.78250	9.82759
	B->CON (FF)	A	0.11954	0.69781	6.86337
	B->CON (RF)	!A	0.07901	0.76994	9.42625

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	0.10579	1.76109	28.42530
	A->S (FR)	B	0.17606	1.65478	24.95690
	B->S (RR)	!A	0.12243	1.71743	27.29400
	B->S (FR)	A	0.16951	1.72601	26.24310
	CON->S (FR)	-	0.02708	0.65123	9.97172
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.10422	1.61333	22.05760
	A->S (FR)	B	0.16794	1.48229	18.41120
	B->S (RR)	!A	0.12140	1.58081	21.29730
	B->S (FR)	A	0.16108	1.54325	19.33190
	CON->S (FR)	-	0.03007	0.73473	10.06020

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	0.10866	1.80628	29.38580
	A->S (RF)	B	0.17636	1.38537	19.82340
	B->S (FF)	!A	0.12676	1.79832	29.05240
	B->S (RF)	A	0.17969	1.36630	19.84580
	CON->S (RF)	-	0.02668	0.71069	10.96950
sky130_osu_sc_18T_ms__addh_1	A->S (FF)	!B	0.10526	1.64669	22.59170
	A->S (RF)	B	0.16516	1.30056	15.74120
	B->S (FF)	!A	0.12338	1.63616	22.20860
	B->S (RF)	A	0.16856	1.28311	15.69920
	CON->S (RF)	-	0.03040	0.78868	10.87320

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	0.01241	0.01454	0.05824
	B	0.00000	0.00000	0.00000
	B	0.01125	0.01325	0.06765
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01025	0.01239	0.05847
	B	0.00000	0.00000	0.00000
	B	0.00908	0.01102	0.06396

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	0.01686	0.02074	0.09676
	B	0.00000	0.00000	0.00000
	B	0.01778	0.02285	0.10596
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.01457	0.01761	0.07583
	B	0.00000	0.00000	0.00000
	B	0.01551	0.01950	0.08161

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	0.01105	0.01320	0.05617
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01565	0.01833	0.05149
	B	A	0.00000	0.00000	0.00000
	B	A	0.00990	0.01191	0.06550
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01735	0.01911	0.04884
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00902	0.01115	0.05675
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01292	0.01511	0.04142
	B	A	0.00000	0.00000	0.00000
	B	A	0.00788	0.00982	0.06267
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01466	0.01599	0.03874

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	0.01644	0.01989	0.08341
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00745	0.00993	0.04334
	B	A	0.00000	0.00000	0.00000
	B	A	0.01746	0.02197	0.09075
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00773	0.00994	0.04230
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01427	0.01726	0.07427
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00523	0.00680	0.02809
	B	A	0.00000	0.00000	0.00000
	B	A	0.01529	0.01921	0.08019
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00551	0.00682	0.02806

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	0.01846	0.02237	0.09881
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01089	0.01402	0.06227
	B	A	0.00000	0.00000	0.00000
	B	A	0.01982	0.02496	0.10866
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01067	0.01338	0.05714
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01541	0.01845	0.07717
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00714	0.00877	0.03067
	B	A	0.00000	0.00000	0.00000
	B	A	0.01660	0.02060	0.08329
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00716	0.00850	0.02948

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	0.01371	0.01589	0.06065
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01797	0.02081	0.06021
	B	A	0.00000	0.00000	0.00000
	B	A	0.01254	0.01461	0.06883
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01974	0.02193	0.05863
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.01087	0.01306	0.05884
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01375	0.01600	0.04149
	B	A	0.00000	0.00000	0.00000
	B	A	0.00969	0.01163	0.06453
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01553	0.01693	0.03924

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00587	0.00601	3.16328
sky130_osu_sc_18T_ms__and2_2	0.00587	0.00601	6.09531
sky130_osu_sc_18T_ms__and2_4	0.00588	0.00602	11.66609
sky130_osu_sc_18T_ms__and2_6	0.00591	0.00601	17.12609
sky130_osu_sc_18T_ms__and2_8	0.00590	0.00604	21.94160
sky130_osu_sc_18T_ms__and2_l	0.00452	0.00464	2.20273

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	166.10600	265.24200
sky130_osu_sc_18T_ms__and2_2	0.00000	265.33600	265.44700
sky130_osu_sc_18T_ms__and2_4	0.00000	464.17800	530.33900
sky130_osu_sc_18T_ms__and2_6	0.00000	663.01500	795.29400
sky130_osu_sc_18T_ms__and2_8	0.00000	861.82100	1060.22000
sky130_osu_sc_18T_ms__and2_l	0.00000	104.08300	166.18100

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)	0.07756	0.59677	7.84710
	B->Y (RR)	0.08299	0.57635	7.49133
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.09012	0.55874	7.85989
	B->Y (RR)	0.09565	0.53492	7.49316
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.12497	0.58522	8.05095
	B->Y (RR)	0.13055	0.55441	7.68214
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.16117	0.62849	8.21072
	B->Y (RR)	0.16667	0.59319	7.83435
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.19683	0.67429	8.32699
	B->Y (RR)	0.20245	0.63479	7.93271
sky130_osu_sc_18T_ms__and2_1	A->Y (RR)	0.08500	0.64547	7.61065
	B->Y (RR)	0.09086	0.62545	7.27844

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)	0.06376	0.54463	7.30991
	B->Y (FF)	0.06672	0.55859	7.42013
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.07072	0.48465	7.19301
	B->Y (FF)	0.07454	0.49896	7.32713
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.09667	0.49256	7.31409
	B->Y (FF)	0.10061	0.50439	7.44637
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.12573	0.52834	7.41551
	B->Y (FF)	0.12960	0.53814	7.54902
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.15323	0.56202	7.30981
	B->Y (FF)	0.15726	0.57125	7.44407
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.06818	0.61472	7.28876
	B->Y (FF)	0.07186	0.63190	7.42709

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	0.01337	0.02130	0.17663
	B	0.00000	0.00000	0.00000
	B	0.01336	0.01900	0.14065
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.02077	0.02796	0.18366
	B	0.00000	0.00000	0.00000
	B	0.02080	0.02589	0.14616
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.03872	0.04390	0.19521
	B	0.00000	0.00000	0.00000
	B	0.03875	0.04198	0.15951
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.06203	0.06256	0.20873
	B	0.00000	0.00000	0.00000
	B	0.06215	0.05966	0.17417
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.08881	0.08214	0.22489
	B	0.00000	0.00000	0.00000
	B	0.08886	0.07826	0.18757
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00897	0.01455	0.12397
	B	0.00000	0.00000	0.00000
	B	0.00902	0.01315	0.10203

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	0.01959	0.03010	0.17336
	B	0.00000	0.00000	0.00000
	B	0.02162	0.03181	0.17174
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.02803	0.03833	0.18036
	B	0.00000	0.00000	0.00000
	B	0.03007	0.03972	0.17871
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.05018	0.05765	0.19600
	B	0.00000	0.00000	0.00000
	B	0.05205	0.05888	0.19385
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.07395	0.07772	0.21255
	B	0.00000	0.00000	0.00000
	B	0.07569	0.07858	0.20940
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.10220	0.09849	0.22922
	B	0.00000	0.00000	0.00000
	B	0.10377	0.09833	0.22377
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.01461	0.02174	0.12003
	B	0.00000	0.00000	0.00000
	B	0.01614	0.02308	0.12010

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)	-0.00513	-0.00518	-0.00520
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00398	-0.00403	-0.00405
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00168	-0.00173	-0.00175
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00059	0.00054	0.00052
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00292	0.00287	0.00285
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00388	-0.00391	-0.00393

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)	0.00751	0.00756	0.00753
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00867	0.00872	0.00869
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01098	0.01103	0.01100
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01332	0.01336	0.01334
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.01560	0.01565	0.01562
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00538	0.00541	0.00539

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)	-0.00486	-0.00487	-0.00486
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00371	-0.00373	-0.00371
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00141	-0.00144	-0.00141
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00089	0.00087	0.00089
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00319	0.00317	0.00319
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00368	-0.00369	-0.00368

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)	0.00733	0.00725	0.00720
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00849	0.00840	0.00835
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01080	0.01071	0.01066
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01311	0.01302	0.01297
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.01542	0.01533	0.01528
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00524	0.00517	0.00514

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00565	0.00581	0.00561	1.50145

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	69.44720	141.46900

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)	0.06506	0.69833	8.49049
	A1->Y (FR)	0.05606	0.66781	8.19304
	B0->Y (FR)	0.04588	0.72310	9.07265

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)	0.06665	0.69649	8.41035
	A1->Y (RF)	0.06140	0.73611	9.02368
	B0->Y (RF)	0.03551	0.67427	8.55040

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	0.01505	0.01667	0.05093
	A1	0.00000	0.00000	0.00000
	A1	0.01272	0.01437	0.04785
	B0	0.00873	0.01246	0.05668

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	0.00672	0.00751	0.03061
	A1	0.00000	0.00000	0.00000
	A1	0.00688	0.00816	0.03275
	B0	0.00134	0.00335	0.02837

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)	-0.00386	-0.00496	-0.00458
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00456	-0.00460	-0.00457
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00572	-0.00574	-0.00572

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)	0.00691	0.00693	0.00675
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00687	0.00692	0.00689
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00588	0.00579	0.00575

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)	-0.00381	-0.00492	-0.00452
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00450	-0.00453	-0.00451
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00603	-0.00608	-0.00610

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)	0.00685	0.00685	0.00670
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00680	0.00688	0.00683
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00609	0.00616	0.00612

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)	-0.00218	-0.00220	-0.00211

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)	0.00396	0.00395	0.00338

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__aoi22_l	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__aoi22_l	0.00565	0.00581	0.00597	0.00574	1.43043

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_l	0.00000	77.89550	264.37800

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)	0.08161	0.71432	8.36571
	A1->Y (FR)	0.07291	0.69388	8.20669
	B0->Y (FR)	0.04784	0.71335	8.80130
	B1->Y (FR)	0.05653	0.73921	9.04535

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)	0.08949	0.70761	8.17310
	A1->Y (RF)	0.08426	0.74499	8.78948
	B0->Y (RF)	0.04121	0.70188	8.75139
	B1->Y (RF)	0.04668	0.66151	8.13451

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	0.01878	0.02031	0.05648
	A1	0.01647	0.01800	0.05332
	B0	0.00946	0.01335	0.06072
	B1	0.01177	0.01552	0.06291

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.01056	0.01125	0.03622
	A1	0.01074	0.01187	0.03814
	B0	0.00512	0.00682	0.03143
	B1	0.00504	0.00627	0.02934

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)	-0.00332	-0.00456	-0.00356
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00341	-0.00343	-0.00342
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00572	-0.00574	-0.00571
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00572	-0.00574	-0.00571

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_1	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00809	0.00811	0.00766
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00801	0.00806	0.00803
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00588	0.00579	0.00575
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00588	0.00579	0.00575

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_1	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00327	-0.00452	-0.00351
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00335	-0.00339	-0.00336
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00603	-0.00603	-0.00609
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00603	-0.00603	-0.00610

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)	0.00804	0.00805	0.00761
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00795	0.00803	0.00797
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00609	0.00615	0.00612
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00609	0.00615	0.00612

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)	-0.00218	-0.00220	-0.00212
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00094	-0.00096	-0.00098
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00616	-0.00620	-0.00624
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00616	-0.00621	-0.00624

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)	0.00405	0.00405	0.00342
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00348	0.00351	0.00340
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00623	0.00633	0.00626
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00623	0.00633	0.00626

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)	-0.00219	-0.00221	-0.00213
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00095	-0.00098	-0.00099
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00579	-0.00580	-0.00579
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00579	-0.00581	-0.00579

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)	0.00406	0.00406	0.00344
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00350	0.00351	0.00342
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00596	0.00587	0.00582
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00596	0.00587	0.00582

SKY130_OSU_SC_18T_MS__BUF_x

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

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	0.00600	3.16064
sky130_osu_sc_18T_ms__buf_2	0.00601	6.12751
sky130_osu_sc_18T_ms__buf_4	0.00600	11.80118
sky130_osu_sc_18T_ms__buf_6	0.00097	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00602	22.70400
sky130_osu_sc_18T_ms__buf_l	0.00468	2.21853

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	133.11000	133.12000
sky130_osu_sc_18T_ms__buf_2	0.00000	199.33500	265.37000
sky130_osu_sc_18T_ms__buf_4	0.00000	332.09700	530.32800
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	597.60300	1060.21000
sky130_osu_sc_18T_ms__buf_l	0.00000	83.40140	83.40580

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)	0.05838	0.54312	7.33914
sky130_osu_sc_18T_ms__buf_2	A->Y (RR)	0.06545	0.49592	7.32459
sky130_osu_sc_18T_ms__buf_4	A->Y (RR)	0.08752	0.50568	7.50328
sky130_osu_sc_18T_ms__buf_8	A->Y (RR)	0.13269	0.57111	7.82364
sky130_osu_sc_18T_ms__buf_l	A->Y (RR)	0.06423	0.59027	7.13150

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)	0.06066	0.54425	7.47334
sky130_osu_sc_18T_ms__buf_2	A->Y (FF)	0.06840	0.48794	7.44317
sky130_osu_sc_18T_ms__buf_4	A->Y (FF)	0.09440	0.49544	7.56754
sky130_osu_sc_18T_ms__buf_8	A->Y (FF)	0.15085	0.56658	7.71952
sky130_osu_sc_18T_ms__buf_l	A->Y (FF)	0.06583	0.61935	7.52629

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	0.00928	0.01726	0.15161
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01611	0.02394	0.15765
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.03178	0.04017	0.17345
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.07117	0.07618	0.20622
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00652	0.01239	0.11270

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	0.01889	0.03025	0.18107
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.02733	0.03842	0.18729
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.04930	0.05752	0.20259
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.10192	0.09832	0.23302
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.01419	0.02196	0.12720

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
	-0.00082	-0.00082	-0.00079

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
	0.00082	0.00082	0.00079

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00581	0.00571	0.01642	2.92774	2.90447
sky130_osu_sc_18T_ms__dffr_l	0.00581	0.00571	0.01642	2.18634	2.17967

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	439.55900	689.35400
sky130_osu_sc_18T_ms__dffr_l	0.00000	389.85400	639.65600

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)	0.26547	1.38537	17.63090
	QN->Q (FR)	0.02817	0.70379	10.59730
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RR)	0.26203	1.51975	18.03910
	QN->Q (FR)	0.02943	0.74623	10.50260

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)	0.27942	1.42089	18.24900
	QN->Q (RF)	0.03165	0.81593	12.34760
	RN->Q (FF)	0.21002	1.31189	17.54320
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RF)	0.28149	1.55555	18.47400
	QN->Q (RF)	0.03269	0.84256	11.91950
	RN->Q (FF)	0.21260	1.44747	17.76660

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)	0.24172	0.73926	6.98970
	RN->QN (FR)	0.17226	0.63074	6.28370
sky130_osu_sc_18T_ms__dffr_1	CK->QN (RR)	0.24065	0.78446	7.09320
	RN->QN (FR)	0.17164	0.67621	6.38433

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)	0.23343	0.80554	8.05304
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RF)	0.22575	0.84862	8.14149

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)	-0.07766	-0.07547	0.08144
	setup	CK (R)	0.21298	0.23303	0.23345
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.08050	-0.07547	0.08139
	setup	CK (R)	0.21308	0.23386	0.23960

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)	-0.10360	-0.22667	-1.77879
	setup	CK (R)	0.12921	0.24080	1.84618
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.10030	-0.22727	-1.77734
	setup	CK (R)	0.12921	0.24080	1.84618

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)	-0.07766	-0.07547	0.08144
	setup	CK (R)	0.21298	0.23303	0.23345
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.08050	-0.07547	0.08139
	setup	CK (R)	0.21308	0.23386	0.23960

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)	-0.10360	-0.22667	-1.77879
	setup	CK (R)	0.12921	0.24080	1.84618
sky130_osu_sc_18T_ms_dffr_l	hold	CK (R)	-0.10030	-0.22727	-1.77734
	setup	CK (R)	0.12921	0.24080	1.84618

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)	0.16293	0.19964	0.73419
	removal	CK (R)	-0.03366	-0.04302	-0.12430
sky130_osu_sc_18T_ms_dffr_l	recovery	CK (R)	0.16317	0.20025	0.73926
	removal	CK (R)	-0.03366	-0.04302	-0.12430

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)	0.16293	0.19964	0.73419
	removal	CK (R)	-0.03366	-0.04302	-0.12430
sky130_osu_sc_18T_ms_dffr_l	recovery	CK (R)	0.16317	0.20025	0.73926
	removal	CK (R)	-0.03366	-0.04302	-0.12430

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 ()	0.11729	0.54688	13.33370
	min_pulse_width	RN ()	0.11934	0.54688	13.33370
sky130_osu_sc_18T_ms_dffr_l	min_pulse_width	RN ()	0.11525	0.54688	13.33370
	min_pulse_width	RN ()	0.11525	0.54688	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 ()	0.12957	0.54688	13.33370
	min_pulse_width	CK ()	0.14389	0.54688	13.33370
sky130_osu_sc_18T_ms_dffr_1	min_pulse_width	CK ()	0.12343	0.54688	13.33370
	min_pulse_width	CK ()	0.13979	0.54688	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 ()	0.26458	0.54688	13.33370
	min_pulse_width	CK ()	0.10911	0.54688	13.33370
sky130_osu_sc_18T_ms_dffr_1	min_pulse_width	CK ()	0.26458	0.54688	13.33370
	min_pulse_width	CK ()	0.10706	0.54688	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	0.02573	0.02993	0.09728
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.02301	0.02862	0.12346

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	0.02794	0.02885	0.06787
	RN	-0.00194	-0.13817	-2.37125
	RN	0.04720	0.04951	0.09250
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.02524	0.02759	0.09411
	RN	-0.00194	-0.11596	-1.77082
	RN	0.04447	0.04820	0.11896

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	0.02519	0.02612	0.06504
	RN	-0.00194	-0.13751	-2.34479
	RN	0.04576	0.04808	0.09134
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.02281	0.02516	0.09162
	RN	-0.00194	-0.11575	-1.76123
	RN	0.04332	0.04705	0.11740

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	0.02357	0.02782	0.09574
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.02102	0.02661	0.12111

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	0.00073	-0.00024	0.00029
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02460	0.02899	0.15602
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01262	0.01704	0.13843
sky130_osu_sc_18T_ms_dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00030	-0.00068	-0.00014
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02417	0.02856	0.15559
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01219	0.01661	0.13800

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	0.01172	0.01169	0.01153
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03846	0.04424	0.17284
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01762	0.02336	0.14866
sky130_osu_sc_18T_ms_dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01129	0.01126	0.01110
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.03803	0.04381	0.17240
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01719	0.02292	0.14822

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)	0.01045	0.01933	0.19819
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02100	0.02998	0.21741
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)	0.01001	0.01889	0.19776
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02057	0.02955	0.21698

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
	$(CK * !Q * QN) + (!CK * !D * !Q * QN)$	0.01708	0.02871	0.21004
	$(!CK * D * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * !Q * QN)$	0.03556	0.04654	0.23408
sky130_osu_sc_18T_ms_dffr_1	$(CK * !Q * QN) + (!CK * !D * !Q * QN)$	0.00000	0.00000	0.00000
	$(CK * !Q * QN) + (!CK * !D * !Q * QN)$	0.01665	0.02828	0.20960
	$(!CK * D * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * !Q * QN)$	0.03513	0.04610	0.23365

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
	$(D * RN * Q * !QN)$	0.00350	0.01203	0.19013
	$(D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * !Q * QN)$	0.01234	0.02059	0.21168
	$(!D * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * !Q * QN)$	0.00260	0.01111	0.18839
sky130_osu_sc_18T_ms_dffr_1	$(D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(D * RN * Q * !QN)$	0.00306	0.01160	0.18970
	$(D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * !Q * QN)$	0.01191	0.02016	0.21124
	$(!D * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * !Q * QN)$	0.00216	0.01068	0.18795

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)	0.02518	0.03690	0.21731
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05380	0.06358	0.28816
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.04200	0.05205	0.23998
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.05276	0.07321	0.36007
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02914	0.04032	0.21965
sky130_osu_sc_18T_ms_dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.02475	0.03646	0.21688
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.05337	0.06315	0.28773
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.04157	0.05162	0.23955
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.05232	0.07278	0.35966
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02870	0.03989	0.21921

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00576	0.00572	0.01227	0.01666	3.11948	3.10001
sky130_osu_sc_18T_ms__dffsr_l	0.00576	0.00572	0.01226	0.01666	2.18722	2.18170

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffsr_1	0.00000	503.45300	689.70400
sky130_osu_sc_18T_ms__dffsr_l	0.00000	453.74100	639.99400

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)	0.27517	1.39356	18.05070
	QN->Q (FR)	0.02681	0.69139	10.57060
	RN->Q (RR)	0.22003	1.34722	18.04430
	SN->Q (FR)	0.19270	1.27825	17.32180
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RR)	0.27847	1.53501	18.02610
	QN->Q (FR)	0.02937	0.74450	10.47130
	RN->Q (RR)	0.22389	1.48848	18.02130
	SN->Q (FR)	0.19635	1.41586	17.29550

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)	0.32717	1.47201	18.66580
	QN->Q (RF)	0.02924	0.77994	12.00650
	RN->Q (FF)	0.21260	1.31924	17.94010
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RF)	0.33354	1.61519	18.52830
	QN->Q (RF)	0.03263	0.84086	11.90950
	RN->Q (FF)	0.21886	1.46179	17.80420

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)	0.28986	0.79736	7.21893
	RN->QN (FR)	0.17615	0.64477	6.49615
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RR)	0.29164	0.84333	7.15122
	RN->QN (FR)	0.17773	0.69110	6.42570

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)	0.24434	0.81229	8.18344
	RN->QN (RF)	0.18932	0.76600	8.18016
	SN->QN (FF)	0.16205	0.69672	7.46046
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.24256	0.86474	8.15109
	RN->QN (RF)	0.18818	0.81923	8.14440
	SN->QN (FF)	0.16073	0.74568	7.41834

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)	-0.08276	-0.08422	0.05788
	setup	CK (R)	0.21079	0.23550	0.29605
sky130_osu_sc_18T_ms_dffsr_l	hold	CK (R)	-0.08132	-0.08296	0.05837
	setup	CK (R)	0.21158	0.23514	0.29315

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)	-0.11763	-0.24664	-1.82253
	setup	CK (R)	0.15517	0.25917	1.89545
sky130_osu_sc_18T_ms_dffsr_l	hold	CK (R)	-0.11793	-0.24458	-1.82624
	setup	CK (R)	0.15477	0.25890	1.89558

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)	-0.08276	-0.08422	0.05788
	setup	CK (R)	0.21079	0.23550	0.29605
sky130_osu_sc_18T_ms_dffsr_l	hold	CK (R)	-0.08132	-0.08296	0.05837
	setup	CK (R)	0.21158	0.23514	0.29315

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)	-0.11763	-0.24664	-1.82253
	setup	CK (R)	0.15517	0.25917	1.89545
sky130_osu_sc_18T_ms_dffsr_l	hold	CK (R)	-0.11793	-0.24458	-1.82624
	setup	CK (R)	0.15477	0.25890	1.89558

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)	0.14790	0.18097	0.72592
	removal	CK (R)	-0.01759	-0.02542	-0.06313
	hold	SN (R)	-0.14907	-0.29237	-1.05563
	setup	SN (R)	0.18128	0.34990	2.85032
sky130_osu_sc_18T_ms_dffsr_l	recovery	CK (R)	0.14563	0.18188	0.72324
	removal	CK (R)	-0.01774	-0.02542	-0.06313
	hold	SN (R)	-0.14829	-0.28548	-1.02452
	setup	SN (R)	0.17956	0.34173	2.79215

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)	0.14790	0.18097	0.72592
	removal	CK (R)	-0.01759	-0.02542	-0.06313
	hold	SN (R)	-0.14907	-0.29237	-1.05919
	hold	SN (R)	-0.14974	-0.29613	-1.05563
	setup	SN (R)	0.18128	0.34748	2.64089
	setup	SN (R)	0.17600	0.34990	2.85032
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.14563	0.18188	0.72324
	removal	CK (R)	-0.01774	-0.02542	-0.06313
	hold	SN (R)	-0.14956	-0.28548	-1.02987
	hold	SN (R)	-0.14829	-0.28770	-1.02452
	setup	SN (R)	0.17956	0.33857	2.57638
	setup	SN (R)	0.16849	0.34173	2.79215

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 ()	0.13570	0.54688	13.33370
	min_pulse_width	RN ()	0.13570	0.54688	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.13570	0.54688	13.33370
	min_pulse_width	RN ()	0.13161	0.54688	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)	0.05348	0.08733	2.26622
	removal	CK (R)	-0.02562	-0.06466	-0.29674
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.05316	0.08694	2.20237
	removal	CK (R)	-0.02739	-0.06689	-0.29851

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)	0.05348	0.08733	2.26622
	removal	CK (R)	-0.02562	-0.06466	-0.29674
sky130_osu_sc_18T_ms_dffsr_l	recovery	CK (R)	0.05316	0.08694	2.20237
	removal	CK (R)	-0.02739	-0.06689	-0.29851

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 ()	0.15207	0.54688	13.33370
	min_pulse_width	SN ()	0.15002	0.54688	13.33370
sky130_osu_sc_18T_ms_dffsr_l	min_pulse_width	SN ()	0.15207	0.54688	13.33370
	min_pulse_width	SN ()	0.14389	0.54688	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 ()	0.13366	0.54688	13.33370
	min_pulse_width	CK ()	0.16025	0.54688	13.33370
sky130_osu_sc_18T_ms_dffsr_l	min_pulse_width	CK ()	0.12957	0.54688	13.33370
	min_pulse_width	CK ()	0.15821	0.54688	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 ()	0.26662	0.54688	13.33370
	min_pulse_width	CK ()	0.13775	0.54688	13.33370
sky130_osu_sc_18T_ms_dffsr_l	min_pulse_width	CK ()	0.26662	0.54688	13.33370
	min_pulse_width	CK ()	0.13570	0.54688	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	0.02996	0.03544	0.12674
	RN	0.04659	0.04945	0.11784
	SN	-0.00194	-0.14353	-2.52663
	SN	0.04080	0.04316	0.11392
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02733	0.03262	0.12686
	RN	0.04398	0.04671	0.11809
	SN	-0.00194	-0.11599	-1.77155
	SN	0.03820	0.04051	0.11497

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	0.03377	0.03517	0.08146
	RN	-0.00194	-0.14353	-2.52659
	RN	0.05166	0.05449	0.10823
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.03110	0.03350	0.10081
	RN	-0.00194	-0.11599	-1.77153
	RN	0.04905	0.05281	0.12754

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	0.03036	0.03175	0.07837
	RN	-0.00194	-0.14299	-2.50499
	RN	0.04897	0.05178	0.10547
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02795	0.03037	0.09772
	RN	-0.00194	-0.11582	-1.76283
	RN	0.04662	0.05038	0.12474

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	0.02779	0.03324	0.12438
	RN	0.04440	0.04731	0.11547
	SN	-0.00194	-0.14299	-2.51059
	SN	0.03944	0.04184	0.11255
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.02535	0.03066	0.12550
	RN	0.04197	0.04471	0.11684
	SN	-0.00194	-0.11582	-1.76689
	SN	0.03703	0.03933	0.11372

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	0.00027	0.00024	0.00028
	(!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)	0.03024	0.03449	0.16223
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01405	0.01834	0.14008
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01434	0.01860	0.13952
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01535	0.01963	0.14088
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00017	-0.00019	-0.00016
	(!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)	0.02981	0.03406	0.16180
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01362	0.01791	0.13965
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01391	0.01817	0.13909
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01492	0.01920	0.14045

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	0.01176	0.01172	0.01163
	(!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)	0.04344	0.04878	0.17701
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01961	0.02519	0.14970
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01917	0.02456	0.14948
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01998	0.02556	0.15050
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01133	0.01128	0.01120
	(!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)	0.04300	0.04833	0.17657
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01917	0.02474	0.14926
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01872	0.02412	0.14904
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01953	0.02512	0.15006

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
	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.01046	0.01926	0.19795
	$(!CK * D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * SN * !Q * QN)$	0.02465	0.03356	0.22400
sky130_osu_sc_18T_ms__dffsr_l	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.01002	0.01884	0.19752
	$(!CK * D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * SN * !Q * QN)$	0.02422	0.03314	0.22357

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
	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.01758	0.02954	0.21171
	$(!CK * D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * SN * !Q * QN)$	0.03715	0.04821	0.23790
sky130_osu_sc_18T_ms__dffsr_l	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)$	0.01713	0.02910	0.21127
	$(!CK * D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * SN * !Q * QN)$	0.03670	0.04777	0.23721

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
	$(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)$	-0.00758	-0.00762	-0.00772
	$(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)$	-0.00674	-0.00900	-0.00830
	$(!CK * D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * !RN * !Q * QN)$	-0.00642	-0.00758	-0.00719
	$(!CK * !D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!CK * !D * RN * Q * !QN)$	0.01449	0.01866	0.13858
sky130_osu_sc_18T_ms__dffsr_1	$(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)$	-0.00801	-0.00806	-0.00815
	$(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)$	-0.00715	-0.00941	-0.00871
	$(!CK * D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!CK * D * !RN * !Q * QN)$	-0.00685	-0.00801	-0.00762
	$(!CK * !D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!CK * !D * RN * Q * !QN)$	0.01407	0.01823	0.13816

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)	0.01753	0.01766	0.01759
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01756	0.01755	0.01724
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01773	0.01783	0.01760
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02965	0.03383	0.15620
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)	0.01710	0.01722	0.01716
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.01710	0.01710	0.01679
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.01729	0.01739	0.01716
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02921	0.03338	0.15576

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)	0.00351	0.01203	0.19025
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01406	0.02232	0.21321
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01494	0.02319	0.21398
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00402	0.01254	0.18992
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01269	0.02797	0.34481
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00308	0.01160	0.18982
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01361	0.02188	0.21277
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01450	0.02275	0.21354
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00358	0.01211	0.18949
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01226	0.02754	0.34438

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
	$(D * RN * SN * !Q * QN)$	0.06039	0.07035	0.29451
	$(D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(D * RN * Q * !QN)$	0.02524	0.03700	0.21749
	$(D * !RN * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * SN * !Q * QN)$	0.04346	0.05368	0.24119
	$(D * !RN * !SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * !SN * !Q * QN)$	0.04439	0.05464	0.24248
	$(!D * RN * SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * RN * SN * Q * !QN)$	0.05813	0.07802	0.36553
	$(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)$	0.03034	0.04153	0.22096
	$(!D * RN * !SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * RN * !SN * Q * !QN)$	0.03216	0.05255	0.37416
sky130_osu_sc_18T_ms__dffsr_1	$(D * RN * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * RN * SN * !Q * QN)$	0.05996	0.06992	0.29408
	$(D * RN * Q * !QN)$	0.00000	0.00000	0.00000
	$(D * RN * Q * !QN)$	0.02481	0.03656	0.21705
	$(D * !RN * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * SN * !Q * QN)$	0.04303	0.05325	0.24075
	$(D * !RN * !SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(D * !RN * !SN * !Q * QN)$	0.04396	0.05421	0.24205
	$(!D * RN * SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * RN * SN * Q * !QN)$	0.05768	0.07758	0.36508
	$(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)$	0.02991	0.04109	0.22052
	$(!D * RN * !SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * RN * !SN * Q * !QN)$	0.03171	0.05211	0.37372

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffb_1	57.87540
sky130_osu_sc_18T_ms__dffb_l	57.87540

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffb_1	0.00579	0.00967	0.01643	2.94159	2.91089
sky130_osu_sc_18T_ms__dffb_l	0.00579	0.00967	0.01643	2.20684	2.18561

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffb_1	0.00000	445.66900	598.84100
sky130_osu_sc_18T_ms__dffb_l	0.00000	395.96700	549.13100

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dfft_1	CK->Q (RR)	0.21336	1.32175	17.54770
	QN->Q (FR)	0.02799	0.69984	10.53720
	SN->Q (FR)	0.15137	1.26019	16.96360
sky130_osu_sc_18T_ms__dfft_1	CK->Q (RR)	0.21379	1.46588	18.05650
	QN->Q (FR)	0.02928	0.74490	10.49530
	SN->Q (FR)	0.15216	1.39703	17.44560

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dfft_1	CK->Q (RF)	0.31378	1.46676	18.31690
	QN->Q (RF)	0.03143	0.81279	12.33200
sky130_osu_sc_18T_ms__dfft_1	CK->Q (RF)	0.31431	1.60234	18.64040
	QN->Q (RF)	0.03252	0.84101	11.95360

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dfft_1	CK->QN (RR)	0.27440	0.78322	7.01408
sky130_osu_sc_18T_ms__dfft_1	CK->QN (RR)	0.27197	0.82546	7.12517

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffa_1	CK->QN (RF)	0.18281	0.74242	7.94705
	SN->QN (FF)	0.12072	0.68073	7.36144
sky130_osu_sc_18T_ms__dffa_1	CK->QN (RF)	0.17930	0.79178	8.04914
	SN->QN (FF)	0.11779	0.72352	7.44163

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__dffa_1	hold	CK (R)	-0.06452	-0.06651	0.10129
	setup	CK (R)	0.15888	0.18657	0.26733
sky130_osu_sc_18T_ms__dffa_l	hold	CK (R)	-0.06327	-0.06571	0.09716
	setup	CK (R)	0.15847	0.18687	0.27187

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffa_1	hold	CK (R)	-0.10446	-0.22872	-1.79883
	setup	CK (R)	0.14232	0.24089	1.86784
sky130_osu_sc_18T_ms__dffa_l	hold	CK (R)	-0.10487	-0.22872	-1.79823
	setup	CK (R)	0.14216	0.24089	1.86783

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__dffa_1	hold	CK (R)	-0.06452	-0.06651	0.10129
	setup	CK (R)	0.15888	0.18657	0.26733
sky130_osu_sc_18T_ms__dffa_l	hold	CK (R)	-0.06327	-0.06571	0.09716
	setup	CK (R)	0.15847	0.18687	0.27187

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)	-0.10446	-0.22872	-1.79883
	setup	CK (R)	0.14232	0.24089	1.86784
sky130_osu_sc_18T_ms_dffs_l	hold	CK (R)	-0.10487	-0.22872	-1.79823
	setup	CK (R)	0.14216	0.24089	1.86783

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)	0.05170	0.07743	1.32119
	removal	CK (R)	-0.02564	-0.06018	-0.33428
sky130_osu_sc_18T_ms_dffs_l	recovery	CK (R)	0.05166	0.07737	1.25321
	removal	CK (R)	-0.02564	-0.06018	-0.33428

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)	0.05170	0.07743	1.32119
	removal	CK (R)	-0.02564	-0.06018	-0.33428
sky130_osu_sc_18T_ms_dffs_l	recovery	CK (R)	0.05166	0.07737	1.25321
	removal	CK (R)	-0.02564	-0.06018	-0.33428

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 ()	0.09888	0.54688	13.33370
	min_pulse_width	SN ()	0.09888	0.54688	13.33370
sky130_osu_sc_18T_ms_dffs_l	min_pulse_width	SN ()	0.09888	0.54688	13.33370
	min_pulse_width	SN ()	0.09274	0.54688	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 ()	0.10297	0.54688	13.33370
	min_pulse_width	CK ()	0.15411	0.54688	13.33370
sky130_osu_sc_18T_ms_dffs_1	min_pulse_width	CK ()	0.09888	0.54688	13.33370
	min_pulse_width	CK ()	0.15002	0.54688	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 ()	0.21344	0.54688	13.33370
	min_pulse_width	CK ()	0.12548	0.54688	13.33370
sky130_osu_sc_18T_ms_dffs_1	min_pulse_width	CK ()	0.21344	0.54688	13.33370
	min_pulse_width	CK ()	0.12548	0.54688	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02317	0.02747	0.09571
	SN	-0.00194	-0.13856	-2.38252
	SN	0.03198	0.03418	0.07941
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02057	0.02612	0.12114
	SN	-0.00194	-0.11662	-1.78745
	SN	0.02936	0.03288	0.10477

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02905	0.03010	0.07475
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02633	0.02878	0.09757

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02594	0.02699	0.06971
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02353	0.02600	0.09488

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.02152	0.02594	0.09474
	SN	-0.00194	-0.13769	-2.35726
	SN	0.03113	0.03336	0.07911
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.01907	0.02467	0.11950
	SN	-0.00194	-0.11594	-1.77006
	SN	0.02869	0.03224	0.10351

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	-0.00052	-0.00054	-0.00051
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02249	0.02740	0.15762
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01147	0.01593	0.13827
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	-0.00095	-0.00097	-0.00094
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02206	0.02697	0.15718
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01104	0.01550	0.13784

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.01109	0.01104	0.01096
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03652	0.04210	0.17078
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01784	0.02364	0.14872
sky130_osu_sc_18T_ms__dfft_1	CK	0.00000	0.00000	0.00000
	CK	0.01066	0.01061	0.01052
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.03609	0.04166	0.17034
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01741	0.02321	0.14828

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dfft_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00548	-0.00554	-0.00553
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01121	0.01524	0.12309
sky130_osu_sc_18T_ms__dfft_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00591	-0.00598	-0.00596
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01078	0.01481	0.12266

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
	$(CK * Q * !QN) + (!CK * D * Q * !QN)$	0.01316	0.01316	0.01307
	$(!CK * !D * Q * !QN)$	0.00000	0.00000	0.00000
	$(!CK * !D * Q * !QN)$	0.02018	0.02579	0.13749
sky130_osu_sc_18T_ms_dffs_l	$(CK * Q * !QN) + (!CK * D * Q * !QN)$	0.00000	0.00000	0.00000
	$(CK * Q * !QN) + (!CK * D * Q * !QN)$	0.01272	0.01273	0.01264
	$(!CK * !D * Q * !QN)$	0.00000	0.00000	0.00000
	$(!CK * !D * Q * !QN)$	0.01975	0.02536	0.13706

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
	$(D * Q * !QN)$	0.00232	0.01099	0.18923
	$(!D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * SN * !Q * QN)$	0.00326	0.01180	0.18933
	$(!D * !SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * !SN * Q * !QN)$	0.01003	0.02574	0.34379
sky130_osu_sc_18T_ms_dffs_l	$(D * Q * !QN)$	0.00000	0.00000	0.00000
	$(D * Q * !QN)$	0.00188	0.01056	0.18879
	$(!D * SN * !Q * QN)$	0.00000	0.00000	0.00000
	$(!D * SN * !Q * QN)$	0.00282	0.01137	0.18890
	$(!D * !SN * Q * !QN)$	0.00000	0.00000	0.00000
	$(!D * !SN * Q * !QN)$	0.00960	0.02531	0.34335

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)	0.05262	0.06265	0.28905
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02403	0.03577	0.21643
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.05089	0.07107	0.35765
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02955	0.04076	0.22033
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.03027	0.05100	0.37367
sky130_osu_sc_18T_ms_dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.05219	0.06222	0.28862
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02360	0.03534	0.21600
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.05045	0.07059	0.35722
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.02912	0.04032	0.21990
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02984	0.05057	0.37324

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00595	0.01641	3.13021	3.10830
sky130_osu_sc_18T_ms__dff_l	0.00595	0.01641	2.19631	2.18566

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	447.28400	556.75400
sky130_osu_sc_18T_ms__dff_l	0.00000	397.57100	507.04300

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)	0.19490	1.30397	17.95290
	QN->Q (FR)	0.02663	0.68889	10.54090
sky130_osu_sc_18T_ms__dff_1	CK->Q (RR)	0.20099	1.45721	18.05650
	QN->Q (FR)	0.02985	0.75644	10.66260

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)	0.26091	1.39532	18.61460
	QN->Q (RF)	0.02911	0.77635	11.99640
sky130_osu_sc_18T_ms__dff_1	CK->Q (RF)	0.26848	1.55102	18.65250
	QN->Q (RF)	0.03260	0.84007	11.91660

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)	0.22543	0.72017	7.13933
sky130_osu_sc_18T_ms__dff_1	CK->QN (RR)	0.22801	0.77498	7.17262

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)	0.16565	0.72279	8.07084
sky130_osu_sc_18T_ms__dff_1	CK->QN (RF)	0.16655	0.77985	8.03950

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)	-0.05730	-0.06243	0.09186
	setup	CK (R)	0.13670	0.16893	0.27540
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.05778	-0.06243	0.09059
	setup	CK (R)	0.13784	0.17152	0.27597

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)	-0.09359	-0.22988	-1.78634
	setup	CK (R)	0.11492	0.24080	1.85570
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.09201	-0.22988	-1.78372
	setup	CK (R)	0.11492	0.24080	1.85570

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 ()	0.09479	0.54688	13.33370
	min_pulse_width	CK ()	0.13775	0.54688	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.09274	0.54688	13.33370
	min_pulse_width	CK ()	0.13366	0.54688	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 ()	0.19298	0.54688	13.33370
	min_pulse_width	CK ()	0.08865	0.54688	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.19298	0.54688	13.33370
	min_pulse_width	CK ()	0.08865	0.54688	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	0.02400	0.03011	0.12536
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02156	0.02742	0.12580

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	0.02815	0.02990	0.07908
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02567	0.02803	0.09334

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	0.02546	0.02722	0.07659
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.02328	0.02565	0.09137

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	0.02235	0.02850	0.12344
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.02002	0.02595	0.12395

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	-0.00043	-0.00139	-0.00085
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02132	0.02651	0.16002
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00086	-0.00182	-0.00128
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02089	0.02608	0.15960

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	0.01056	0.01053	0.01037
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03698	0.04292	0.17417
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01012	0.01009	0.00993
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.03655	0.04250	0.17375

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)	0.00231	0.01100	0.18922
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00270	0.01126	0.18877
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00188	0.01057	0.18878
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00226	0.01083	0.18834

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)	0.02396	0.03575	0.21635
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.05155	0.06163	0.28928
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.05145	0.07229	0.36362
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02888	0.04011	0.21964
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.02353	0.03532	0.21591
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.05112	0.06121	0.28885
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.05103	0.07186	0.36320
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.02845	0.03967	0.21921

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

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	0.00576	3.04108
sky130_osu_sc_18T_ms__inv_10	0.05452	25.41603
sky130_osu_sc_18T_ms__inv_2	0.01110	5.69082
sky130_osu_sc_18T_ms__inv_3	0.01655	8.34106
sky130_osu_sc_18T_ms__inv_4	0.02193	10.93468
sky130_osu_sc_18T_ms__inv_6	0.03288	16.15496
sky130_osu_sc_18T_ms__inv_8	0.04371	20.95431
sky130_osu_sc_18T_ms__inv_l	0.00441	2.10361

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	66.55050	132.73600
sky130_osu_sc_18T_ms__inv_10	0.00000	663.66700	1324.52000
sky130_osu_sc_18T_ms__inv_2	0.00000	132.76400	264.96400
sky130_osu_sc_18T_ms__inv_3	0.00000	199.29100	397.65300
sky130_osu_sc_18T_ms__inv_4	0.00000	265.50500	529.88200
sky130_osu_sc_18T_ms__inv_6	0.00000	398.23900	794.78600
sky130_osu_sc_18T_ms__inv_8	0.00000	530.96800	1059.68000
sky130_osu_sc_18T_ms__inv_l	0.00000	41.69790	83.17210

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)	0.02507	0.62951	9.53220
sky130_osu_sc_18T_ms__inv_10	A->Y (FR)	0.03821	0.38665	9.16204
sky130_osu_sc_18T_ms__inv_2	A->Y (FR)	0.02112	0.52554	9.22680
sky130_osu_sc_18T_ms__inv_3	A->Y (FR)	0.02351	0.48884	9.36046
sky130_osu_sc_18T_ms__inv_4	A->Y (FR)	0.02437	0.45259	9.20531
sky130_osu_sc_18T_ms__inv_6	A->Y (FR)	0.02792	0.41797	9.23599
sky130_osu_sc_18T_ms__inv_8	A->Y (FR)	0.03272	0.39663	9.16698
sky130_osu_sc_18T_ms__inv_l	A->Y (FR)	0.02766	0.68253	9.47622

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)	0.02658	0.69985	10.66990
sky130_osu_sc_18T_ms__inv_10	A->Y (RF)	0.04463	0.44085	9.91005
sky130_osu_sc_18T_ms__inv_2	A->Y (RF)	0.02259	0.58966	10.26790
sky130_osu_sc_18T_ms__inv_3	A->Y (RF)	0.02491	0.55082	10.39190
sky130_osu_sc_18T_ms__inv_4	A->Y (RF)	0.02525	0.51478	10.22460
sky130_osu_sc_18T_ms__inv_6	A->Y (RF)	0.03162	0.47953	10.21480
sky130_osu_sc_18T_ms__inv_8	A->Y (RF)	0.03775	0.45614	10.08540
sky130_osu_sc_18T_ms__inv_l	A->Y (RF)	0.02959	0.74460	10.46780

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	0.00814	0.01246	0.05158
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.07414	0.13901	0.52810
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01472	0.02506	0.10479
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.02253	0.03866	0.15507
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02915	0.05223	0.20936
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.04371	0.08119	0.31088
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.05853	0.10948	0.42005
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00625	0.00899	0.03669

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	0.00173	0.00394	0.02398
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.01395	0.04410	0.24560
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00127	0.00699	0.04744
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00311	0.01252	0.07157
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00290	0.01529	0.09615
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.00426	0.02460	0.14464
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.00740	0.03520	0.19431
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00090	0.00282	0.01860

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.07178	0.07158	0.01168	0.06245

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__mux2_1	0.00000	133.31800	133.31800

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)	-	0.01526	0.07786	0.26126
	A1->Y (RR)	-	0.01614	0.07846	0.26155
	S0->Y (RR)	(!A0 * A1)	0.05021	0.20881	0.85914
	S0->Y (FR)	(A0 * !A1)	0.03694	0.15071	0.47282

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)	-	0.01276	0.07976	0.26904
	A1->Y (FF)	-	0.01266	0.07970	0.26928
	S0->Y (FF)	(!A0 * A1)	0.05605	0.16649	0.22597
	S0->Y (RF)	(A0 * !A1)	0.03222	0.20637	1.19363

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	-	-0.00834	-0.00835	-0.00837
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00282	-0.00281	-0.00285
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00888	0.02150	0.20234
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00529	0.00461	0.18326

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	-	0.00836	0.00836	0.00837
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00894	0.00894	0.00895
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00274	0.01344	0.19320
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.02198	0.03356	0.21366

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)	-0.00088	-0.00088	-0.00088

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
	$(A1 * S0 * Y) + (!A1 * S0 * !Y)$	0.00319	0.00318	0.00319

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
	$(A0 * !S0 * Y) + (!A0 * !S0 * !Y)$	-0.00237	-0.00236	-0.00237

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
	$(A0 * !S0 * Y) + (!A0 * !S0 * !Y)$	0.00237	0.00236	0.00237

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
	$(A0 * A1 * Y)$	-0.00107	0.00932	0.18807
	$(!A0 * !A1 * !Y)$	0.00000	0.00000	0.00000
	$(!A0 * !A1 * !Y)$	-0.00106	0.00957	0.18868

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)	0.01655	0.02855	0.20852
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01441	0.02709	0.20768

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00577	0.00575	1.87503
sky130_osu_sc_18T_ms__nand2_l	0.00442	0.00441	1.31794

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	66.45450	264.88100
sky130_osu_sc_18T_ms__nand2_l	0.00000	41.64200	165.95400

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)	0.02563	0.53382	7.14672
	B->Y (FR)	0.03002	0.53395	7.07809
sky130_osu_sc_18T_ms__nand2_1	A->Y (FR)	0.02810	0.58296	7.18594
	B->Y (FR)	0.03330	0.58608	7.16130

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)	0.03895	0.77154	10.37730
	B->Y (RF)	0.04404	0.73156	9.78548
sky130_osu_sc_18T_ms__nand2_1	A->Y (RF)	0.04382	0.83804	10.28300
	B->Y (RF)	0.04887	0.79789	9.68383

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	0.00866	0.01296	0.05762
	B	0.00000	0.00000	0.00000
	B	0.01100	0.01514	0.06210
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00660	0.00917	0.04038
	B	0.00000	0.00000	0.00000
	B	0.00833	0.01084	0.04344

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	0.00601	0.00775	0.02969
	B	0.00000	0.00000	0.00000
	B	0.00591	0.00720	0.02834
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00360	0.00482	0.02260
	B	0.00000	0.00000	0.00000
	B	0.00355	0.00449	0.02152

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)	-0.00619	-0.00624	-0.00626
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00449	-0.00453	-0.00454

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)	0.00626	0.00631	0.00628
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00454	0.00458	0.00456

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)	-0.00584	-0.00587	-0.00584
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00423	-0.00425	-0.00423

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)	0.00600	0.00593	0.00587
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00435	0.00429	0.00425

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nor2_1	9.52380
sky130_osu_sc_18T_ms__nor2_1	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nor2_1	0.00578	0.00608	1.64864
sky130_osu_sc_18T_ms__nor2_1	0.00435	0.00469	1.15494

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	54.13170	132.55600
sky130_osu_sc_18T_ms__nor2_1	0.00000	36.18950	83.06930

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)	0.04996	0.68264	8.71119
	B->Y (FR)	0.03628	0.70279	9.13023
sky130_osu_sc_18T_ms__nor2_1	A->Y (FR)	0.05417	0.74969	8.67486
	B->Y (FR)	0.04218	0.77952	9.22320

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)	0.03781	0.58778	7.45073
	B->Y (RF)	0.02871	0.57364	7.42643
sky130_osu_sc_18T_ms__nor2_1	A->Y (RF)	0.04030	0.62282	7.34383
	B->Y (RF)	0.03179	0.61242	7.32196

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	0.01236	0.01453	0.05206
	B	0.00000	0.00000	0.00000
	B	0.00883	0.01309	0.06193
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00897	0.01040	0.03844
	B	0.00000	0.00000	0.00000
	B	0.00670	0.00916	0.04331

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	0.00285	0.00478	0.03352
	B	0.00000	0.00000	0.00000
	B	0.00115	0.00347	0.03058
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00198	0.00358	0.02610
	B	0.00000	0.00000	0.00000
	B	0.00066	0.00228	0.02379

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)	-0.00416	-0.00510	-0.00456
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00300	-0.00362	-0.00331

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)	0.00690	0.00689	0.00669
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00476	0.00478	0.00466

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)	-0.00225	-0.00227	-0.00221
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00168	-0.00170	-0.00165

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)	0.00315	0.00316	0.00284
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00233	0.00234	0.00213

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00583	0.00593	0.00488	1.60158

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	58.42410	215.62600

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)	0.04841	0.70920	8.99719
	A1->Y (FR)	0.06542	0.69494	8.59146
	B0->Y (FR)	0.03369	0.62541	8.01375

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)	0.05532	0.73374	9.26637
	A1->Y (RF)	0.07026	0.73065	8.99088
	B0->Y (RF)	0.04243	0.77869	10.02080

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	0.01228	0.01545	0.05566
	A1	0.00000	0.00000	0.00000
	A1	0.01577	0.01742	0.04996
	B0	0.00726	0.01045	0.04789

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	0.00592	0.00689	0.02694
	A1	0.00000	0.00000	0.00000
	A1	0.00708	0.00778	0.02933
	B0	0.00318	0.00475	0.02591

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)	-0.00153	-0.00155	-0.00149
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00572	-0.00576	-0.00573
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00573	-0.00576	-0.00574

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)	0.00388	0.00388	0.00356
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00572	0.00576	0.00574
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00584	0.00579	0.00576

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)	-0.00333	-0.00430	-0.00377
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00567	-0.00572	-0.00568
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00568	-0.00570	-0.00569

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)	0.00754	0.00755	0.00734
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00567	0.00574	0.00570
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00579	0.00577	0.00572

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)	-0.00455	-0.00459	-0.00466

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)	0.00466	0.00472	0.00469

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__oai22_l	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__oai22_l	0.00571	0.00594	0.00607	0.00596	1.57315

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_l	0.00000	80.96890	264.51800

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_1	A0->Y (FR)	0.07078	0.69224	8.44657
	A1->Y (FR)	0.05712	0.71074	8.87308
	B0->Y (FR)	0.03991	0.69413	8.86624
	B1->Y (FR)	0.05383	0.67545	8.44076

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_1	A0->Y (RF)	0.10249	0.79393	9.37031
	A1->Y (RF)	0.07964	0.75914	9.21676
	B0->Y (RF)	0.06796	0.80245	9.95547
	B1->Y (RF)	0.09182	0.84674	10.24020

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	0.02086	0.02239	0.05321
	A1	0.01527	0.01862	0.06286
	B0	0.00947	0.01306	0.05674
	B1	0.01314	0.01488	0.04741

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00766	0.00827	0.02936
	A1	0.00598	0.00689	0.02691
	B0	0.00277	0.00450	0.02870
	B1	0.00432	0.00564	0.03026

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)	-0.00406	-0.00503	-0.00450
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00348	-0.00445	-0.00392
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00568	-0.00573	-0.00569
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00569	-0.00572	-0.00570

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)	0.00695	0.00697	0.00676
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00754	0.00755	0.00735
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00568	0.00573	0.00571
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00582	0.00576	0.00573

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)	-0.00217	-0.00219	-0.00212
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00158	-0.00161	-0.00154
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00567	-0.00571	-0.00568
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00568	-0.00572	-0.00569

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)	0.00321	0.00321	0.00289
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00379	0.00380	0.00347
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00567	0.00571	0.00569
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00580	0.00576	0.00572

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)	-0.00215	-0.00218	-0.00211
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00157	-0.00161	-0.00153
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00620	-0.00625	-0.00621
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00604	-0.00608	-0.00621

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)	0.00319	0.00320	0.00288
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00378	0.00379	0.00346
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00629	0.00632	0.00625
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00623	0.00628	0.00624

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)	-0.00401	-0.00497	-0.00443
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00342	-0.00438	-0.00385
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00627	-0.00632	-0.00627
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00612	-0.00617	-0.00628

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)	0.00688	0.00690	0.00670
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00747	0.00753	0.00728
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00636	0.00642	0.00633
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00628	0.00635	0.00632

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_tt_IP80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00614	0.00592	3.16320
sky130_osu_sc_18T_ms__or2_2	0.00614	0.00592	6.06510
sky130_osu_sc_18T_ms__or2_4	0.00615	0.00593	11.75430
sky130_osu_sc_18T_ms__or2_8	0.00617	0.00595	22.05613
sky130_osu_sc_18T_ms__or2_l	0.00477	0.00452	2.20797

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	87.59850	133.32000
sky130_osu_sc_18T_ms__or2_2	0.00000	120.81100	265.57100
sky130_osu_sc_18T_ms__or2_4	0.00000	187.47400	530.53100
sky130_osu_sc_18T_ms__or2_8	0.00000	320.79200	1060.42000
sky130_osu_sc_18T_ms__or2_l	0.00000	57.15680	83.50110

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)	0.07277	0.57694	7.22973
	B->Y (RR)	0.06075	0.53956	7.11486
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.08020	0.52655	7.18416
	B->Y (RR)	0.06803	0.49293	7.06197
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.10282	0.53506	7.45209
	B->Y (RR)	0.09023	0.50594	7.33012
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.14851	0.59346	7.68548
	B->Y (RR)	0.13523	0.56933	7.56505
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.07890	0.62631	7.08145
	B->Y (RR)	0.06697	0.59152	6.93939

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)	0.10112	0.61331	7.74498
	B->Y (FF)	0.08328	0.60523	7.95302
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.11804	0.56079	7.62970
	B->Y (FF)	0.10029	0.55873	7.83336
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.16520	0.58522	7.85329
	B->Y (FF)	0.14756	0.59218	8.04443
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.26428	0.68408	7.86635
	B->Y (FF)	0.24663	0.70135	8.05014
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.10916	0.68417	7.75276
	B->Y (FF)	0.09209	0.68383	8.01908

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	0.01127	0.01677	0.12055
	B	0.00000	0.00000	0.00000
	B	0.00999	0.01719	0.13935
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01832	0.02416	0.12812
	B	0.00000	0.00000	0.00000
	B	0.01686	0.02416	0.14384
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03445	0.04025	0.14540
	B	0.00000	0.00000	0.00000
	B	0.03262	0.04054	0.16059
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.07476	0.07654	0.18368
	B	0.00000	0.00000	0.00000
	B	0.07213	0.07656	0.18798
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00821	0.01229	0.09053
	B	0.00000	0.00000	0.00000
	B	0.00714	0.01245	0.10060

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	0.02320	0.02908	0.14161
	B	0.00000	0.00000	0.00000
	B	0.01937	0.02949	0.17809
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.03245	0.03726	0.14778
	B	0.00000	0.00000	0.00000
	B	0.02864	0.03737	0.18287
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.05835	0.05684	0.16182
	B	0.00000	0.00000	0.00000
	B	0.05457	0.05721	0.19463
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.12583	0.09959	0.19174
	B	0.00000	0.00000	0.00000
	B	0.12171	0.09907	0.22186
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01706	0.02126	0.10243
	B	0.00000	0.00000	0.00000
	B	0.01442	0.02131	0.12628

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)	-0.00410	-0.00510	-0.00458
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00409	-0.00509	-0.00458
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00409	-0.00509	-0.00457
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00408	-0.00508	-0.00456
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00297	-0.00362	-0.00332

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)	0.00692	0.00692	0.00672
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00692	0.00692	0.00672
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00693	0.00693	0.00673
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00694	0.00694	0.00674
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00479	0.00482	0.00468

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)	-0.00225	-0.00228	-0.00221
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00225	-0.00228	-0.00221
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00225	-0.00227	-0.00221
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00223	-0.00226	-0.00220
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00171	-0.00173	-0.00168

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)	0.00319	0.00318	0.00286
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00319	0.00318	0.00286
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00320	0.00319	0.00286
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00321	0.00320	0.00287
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00239	0.00238	0.00217

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00607	0.00764	1.66180
sky130_osu_sc_18T_ms__tbufi_l	0.00470	0.00594	1.15491

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	66.82120	265.22300
sky130_osu_sc_18T_ms__tbufi_l	0.00000	41.88050	166.21000

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)	0.03524	0.70055	9.13739
	OE->Y (FR)	0.04559	0.39681	5.09400
	OE->Y (RR)	0.07498	0.63734	7.12767
sky130_osu_sc_18T_ms__tbufi_1	A->Y (FR)	0.04101	0.77707	9.20082
	OE->Y (FR)	0.04767	0.39662	5.09376
	OE->Y (RR)	0.08102	0.70413	7.00346

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)	0.03873	0.73574	9.59036
	OE->Y (FF)	0.04639	0.39683	5.09399
	OE->Y (RF)	0.03539	0.68517	8.91492
sky130_osu_sc_18T_ms__tbufi_1	A->Y (RF)	0.04396	0.79534	9.42678
	OE->Y (FF)	0.04838	0.39661	5.09376
	OE->Y (RF)	0.04101	0.74405	8.73461

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	0.01203	0.01552	0.05545
	OE	0.00000	0.00000	0.00000
	OE	0.01223	0.02158	0.17966
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00867	0.01088	0.03877
	OE	0.00000	0.00000	0.00000
	OE	0.00840	0.01521	0.12991

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	0.00538	0.00726	0.02923
	OE	0.00000	0.00000	0.00000
	OE	0.01239	0.02252	0.19967
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00330	0.00459	0.02228
	OE	0.00000	0.00000	0.00000
	OE	0.00812	0.01532	0.14029

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufl_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00422	-0.00425	-0.00420
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00329	-0.00332	-0.00327
sky130_osu_sc_18T_ms__tbufl_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00325	-0.00328	-0.00323
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00260	-0.00262	-0.00259

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufl_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00422	0.00425	0.00420
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00388	0.00390	0.00373
sky130_osu_sc_18T_ms__tbufl_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00325	0.00328	0.00323
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00305	0.00306	0.00294

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)	0.00599	0.01665	0.19737
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00429	0.01501	0.19617
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00395	0.01152	0.13914
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00287	0.01046	0.13831

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)	0.01011	0.02232	0.20484
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00950	0.02192	0.20401
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00785	0.01625	0.14489
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00744	0.01594	0.14439

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00607	0.00966	1.66164
sky130_osu_sc_18T_ms__tnbufi_l	0.00469	0.00721	1.15513

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	110.95400	133.11500
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	69.53460	83.42220

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)	0.03532	0.70054	9.13630
	OE->Y (RR)	0.03397	0.39849	5.09566
	OE->Y (FR)	0.04712	0.67483	8.61088
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (FR)	0.04123	0.77713	9.20148
	OE->Y (RR)	0.03574	0.39880	5.09599
	OE->Y (FR)	0.05162	0.74163	8.53201

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)	0.03824	0.73553	9.58983
	OE->Y (RF)	0.03351	0.39848	5.09567
	OE->Y (FF)	0.05563	0.53906	6.20198
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (RF)	0.04338	0.79518	9.42752
	OE->Y (RF)	0.03536	0.39881	5.09602
	OE->Y (FF)	0.06270	0.61580	6.18699

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	0.00854	0.01205	0.05240
	OE	0.00000	0.00000	0.00000
	OE	0.02144	0.03469	0.21633
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00655	0.00878	0.03687
	OE	0.00000	0.00000	0.00000
	OE	0.01585	0.02491	0.15349

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	0.00167	0.00357	0.02559
	OE	0.00000	0.00000	0.00000
	OE	0.02162	0.03427	0.20236
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00088	0.00219	0.01985
	OE	0.00000	0.00000	0.00000
	OE	0.01566	0.02435	0.14057

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)	-0.00276	-0.00280	-0.00264
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00160	-0.00162	-0.00158
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00215	-0.00218	-0.00205
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00136	-0.00137	-0.00134

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)	0.00480	0.00482	0.00477
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00450	0.00452	0.00436
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00343	0.00345	0.00340
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00326	0.00327	0.00316

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)	-0.00525	0.00541	0.18811
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00598	0.00505	0.18716
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00381	0.00376	0.13260
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00432	0.00351	0.13204

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)	0.01739	0.03085	0.21411
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01586	0.02962	0.21289
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01278	0.02199	0.15128
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01181	0.02134	0.15054

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__xnor2_1	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xnor2_1	0.01202	0.01110	1.67767

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_1	0.00000	237.03100	397.60900

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	0.09391	0.66942	7.23349
	A->Y (FR)	!B	0.04527	0.70678	9.11776
	B->Y (RR)	A	0.07496	0.65568	7.37451
	B->Y (FR)	!A	0.06448	0.69641	8.73915

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	0.10561	0.63700	6.70097
	A->Y (RF)	!B	0.05486	0.72804	9.32996
	B->Y (FF)	A	0.08670	0.62214	6.71623
	B->Y (RF)	!A	0.07177	0.74665	9.32505

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	0.01589	0.02445	0.18190
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.02048	0.03524	0.24981
	B	A	0.00000	0.00000	0.00000
	B	A	0.00897	0.01943	0.20055
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02328	0.03645	0.23937

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	0.03266	0.04321	0.21930
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01579	0.02627	0.21905
	B	A	0.00000	0.00000	0.00000
	B	A	0.03293	0.04511	0.22502
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01450	0.02498	0.21703

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18t_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01203	0.01114	1.68728

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	237.03700	415.37500

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	0.08746	0.66256	7.40008
	A->Y (FR)	B	0.05855	0.69761	8.88436
	B->Y (RR)	!A	0.07678	0.65849	7.42837
	B->Y (FR)	A	0.06339	0.70075	8.85342

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	0.08551	0.60658	6.40339
	A->Y (RF)	B	0.05861	0.76471	9.67781
	B->Y (FF)	!A	0.08146	0.60830	6.58084
	B->Y (RF)	A	0.06722	0.72888	9.11779

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	0.02821	0.04216	0.25270
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00727	0.01612	0.19567
	B	A	0.00000	0.00000	0.00000
	B	A	0.02916	0.04299	0.25047
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00528	0.01559	0.19882

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	0.01548	0.02642	0.22735
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.03218	0.04397	0.21033
	B	A	0.00000	0.00000	0.00000
	B	A	0.01533	0.02590	0.22185
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.02994	0.04248	0.22396

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_tt_1P80_150C.ccs
Cell Library: Process , Voltage 1.80, Temp
150.00

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	1.22042
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	440167.00000	880333.00000
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
	-0.00074	0.15769	2.00001

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
	7.65782	7.25664	2.33476