sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs Library

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

SKY130_OSU_SC_18T_MS__ADDFx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__addf_1	46.88640
sky130_osu_sc_18T_ms__addf_l	46.88640

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_18T_ms__addf_1	0.01863	0.01867	0.01437	2.80626	1.29114	2.71182
sky130_osu_sc_18T_ms__addf_l	0.01862	0.01866	0.01437	2.03128	1.29295	2.02444

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.10067	0.14156
sky130_osu_sc_18T_ms__addf_l	0.00000	0.06608	0.10697

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)	0.12716	1.67063	26.20590
	B->CO (RR)	0.11256	1.57993	24.82460
	CI->CO (RR)	0.12061	1.67773	26.42030
	CON->CO (FR)	0.02536	0.73742	11.37110
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.12660	1.56582	21.89180
	B->CO (RR)	0.11245	1.48878	20.91140
	CI->CO (RR)	0.12005	1.57385	22.13820
	CON->CO (FR)	0.02828	0.78970	11.38550

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)	0.17956	2.17273	33.87070
	B->CO (FF)	0.15966	2.06910	32.28930
	CI->CO (FF)	0.15665	2.11276	33.36740
	CON->CO (RF)	0.02180	0.61924	9.56666
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.17630	1.98033	27.47080
	B->CO (FF)	0.15672	1.89167	26.31220
	CI->CO (FF)	0.15334	1.92158	26.99450
	CON->CO (RF)	0.02326	0.64038	9.22003

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)	0.13245	0.99242	11.67000
	B->CON (FR)	0.11365	0.94112	11.22600
	CI->CON (FR)	0.10969	0.93831	11.24630
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.12715	0.98861	11.67350
	B->CON (FR)	0.10881	0.93656	11.23010
	CI->CON (FR)	0.10426	0.93341	11.25060

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)	0.07702	0.63866	7.57463
	B->CON (RF)	0.06310	0.61076	7.39771
	CI->CON (RF)	0.07043	0.65131	7.89187
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.07450	0.63634	7.57948
	B->CON (RF)	0.06087	0.60866	7.40078
	CI->CON (RF)	0.06791	0.64903	7.89516

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)	0.25906	1.95941	25.90340
	B->S (-R)	0.25848	1.92594	24.93520
	CI->S (-R)	0.23440	1.89562	25.40360
	CON->S (RR)	0.07413	0.62539	7.18674
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.24862	1.84068	22.35570
	B->S (-R)	0.24854	1.81682	21.69720
	CI->S (-R)	0.22387	1.77805	21.87810
	CON->S (RR)	0.07329	0.66710	7.21485

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)	0.20889	1.52402	19.56750
	B->S (-F)	0.21055	1.46242	18.71570
	CI->S (-F)	0.20157	1.52737	19.77340
	CON->S (FF)	0.08881	0.68384	7.39946
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.19973	1.42386	16.79860
	B->S (-F)	0.20169	1.37312	16.21750
	CI->S (-F)	0.19232	1.42872	17.03510
	CON->S (FF)	0.08598	0.70182	7.24702

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	0.00296	0.00313	0.00779
	B	0.00443	0.00442	0.00732
	CI	0.00448	0.00471	0.00938
sky130_osu_sc_18T_ms__addf_l	A	0.00233	0.00242	0.00545
	B	0.00381	0.00370	0.00575
	CI	0.00385	0.00399	0.00705

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01153	0.01168	0.01857
	B	0.01213	0.01234	0.01772
	CI	0.00976	0.00993	0.01705
sky130_osu_sc_18T_ms__addf_l	A	0.01092	0.01101	0.01574
	B	0.01151	0.01171	0.01518
	CI	0.00915	0.00924	0.01433

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01153	0.01147	0.01393
	B	0.01189	0.01199	0.01388
	CI	0.01062	0.01098	0.01302
sky130_osu_sc_18T_ms__addf_l	A	0.01091	0.01088	0.01346
	B	0.01129	0.01135	0.01336
	CI	0.01000	0.01034	0.01250

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00295	0.00305	0.00488
	B	0.00438	0.00428	0.00567
	CI	0.00447	0.00461	0.00655
sky130_osu_sc_18T_ms__addf_l	A	0.00233	0.00238	0.00437
	B	0.00377	0.00361	0.00492
	CI	0.00384	0.00394	0.00593

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.01153	0.01167	0.01813
	B	0.01212	0.01238	0.01748
	CI	0.00976	0.00993	0.01673
sky130_osu_sc_18T_ms__addf_l	A	0.01092	0.01101	0.01578
	B	0.01151	0.01171	0.01521
	CI	0.00915	0.00924	0.01435

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02581	0.02597	0.02762
	B	0.02298	0.02279	0.03134
	CI	0.02085	0.02076	0.02271
sky130_osu_sc_18T_ms__addf_l	A	0.02491	0.02492	0.02658
	B	0.02209	0.02192	0.03081
	CI	0.01998	0.01986	0.02190

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__addh_1	27.83880
sky130_osu_sc_18T_ms__addh_l	27.83880

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_18T_ms__addh_1	0.00917	0.01008	2.77752	1.41575	2.82470
sky130_osu_sc_18T_ms__addh_l	0.00917	0.01008	1.66058	1.40563	1.65738

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.12120	0.14150
sky130_osu_sc_18T_ms__addh_l	0.00000	0.12824	0.14712

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)	0.08590	0.62667	6.93171
	B->CO (RR)	0.08962	0.63824	7.06420
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.08671	0.70225	6.92922
	B->CO (RR)	0.09055	0.71496	7.04891

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)	0.07499	0.65824	7.43055
	B->CO (FF)	0.08033	0.66951	7.43304
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.07426	0.67789	6.81051
	B->CO (FF)	0.07941	0.68951	6.81490

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	0.11625	0.52087	3.66507
	A->CON (FR)	!B	0.07285	0.88586	11.25110
	B->CON (RR)	A	0.12008	0.53180	3.79790
	B->CON (FR)	!A	0.09070	0.94567	11.80000
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.10537	0.49862	3.58193
	A->CON (FR)	!B	0.06557	0.87595	11.20070
	B->CON (RR)	A	0.10920	0.51064	3.69946
	B->CON (FR)	!A	0.08331	0.93542	11.74160

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	0.11313	0.68620	6.13439
	A->CON (RF)	!B	0.04649	0.62147	8.02589
	B->CON (FF)	A	0.11414	0.72223	6.51855
	B->CON (RF)	!A	0.05287	0.60412	7.60211
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.10328	0.65653	5.92408
	A->CON (RF)	!B	0.04321	0.61641	7.99110
	B->CON (FF)	A	0.10417	0.69255	6.29628
	B->CON (RF)	!A	0.04976	0.59952	7.56912

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	0.09139	1.59967	25.79600
	A->S (FR)	B	0.15767	1.64066	23.55470
	B->S (RR)	!A	0.09699	1.52861	24.32220
	B->S (FR)	A	0.15994	1.73002	24.96590
	CON->S (FR)	-	0.02863	0.76447	11.79760
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.09123	1.44707	19.49640
	A->S (FR)	B	0.15114	1.47361	17.23060
	B->S (RR)	!A	0.09715	1.39538	18.57300
	B->S (FR)	A	0.15316	1.54443	18.11260
	CON->S (FR)	-	0.03284	0.84799	11.65310

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	0.11161	1.93070	31.17610
	A->S (RF)	B	0.14846	1.26602	17.30850
	B->S (FF)	!A	0.12940	1.99627	31.79260
	B->S (RF)	A	0.15216	1.27716	17.44190
	CON->S (RF)	-	0.02022	0.60070	9.31079
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.10662	1.64912	22.11440
	A->S (RF)	B	0.13921	1.09922	11.92660
	B->S (FF)	!A	0.12445	1.71233	22.67920
	B->S (RF)	A	0.14305	1.11101	12.05530
	CON->S (RF)	-	0.02261	0.62773	8.64686

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	0.00548	0.00514	0.00488
	B	0.00000	0.00000	0.00000
	B	0.00502	0.00468	0.00486
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00456	0.00419	0.00566
	B	0.00000	0.00000	0.00000
	B	0.00411	0.00380	0.00537

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	0.00846	0.00823	0.01114
	B	0.00000	0.00000	0.00000
	B	0.00881	0.00894	0.01211
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00754	0.00729	0.01029
	B	0.00000	0.00000	0.00000
	B	0.00789	0.00796	0.01111

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	0.00548	0.00516	0.00628
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00740	0.00743	0.00751
	B	A	0.00000	0.00000	0.00000
	B	A	0.00502	0.00487	0.00586
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00816	0.00811	0.00803
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00456	0.00419	0.00560
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00677	0.00677	0.00728
	B	A	0.00000	0.00000	0.00000
	B	A	0.00411	0.00374	0.00544
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00753	0.00745	0.00739

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	0.00846	0.00824	0.01097
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00121	0.00118	0.00099
	B	A	0.00000	0.00000	0.00000
	B	A	0.00881	0.00895	0.01232
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00209	0.00201	0.00187
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00754	0.00730	0.01052
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00044	0.00041	0.00019
	B	A	0.00000	0.00000	0.00000
	B	A	0.00789	0.00796	0.01105
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00133	0.00122	0.00113

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	0.00847	0.00823	0.01116
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00122	0.00124	0.00142
	B	A	0.00000	0.00000	0.00000
	B	A	0.00882	0.00896	0.01219
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00211	0.00204	0.00210
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00755	0.00731	0.00973
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00045	0.00039	0.00051
	B	A	0.00000	0.00000	0.00000
	B	A	0.00790	0.00799	0.01108
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00134	0.00121	0.00092

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	0.00549	0.00515	0.00501
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00740	0.00746	0.00750
	B	A	0.00000	0.00000	0.00000
	B	A	0.00502	0.00469	0.00469
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00817	0.00819	0.00784
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00456	0.00419	0.00753
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00677	0.00680	0.00730
	B	A	0.00000	0.00000	0.00000
	B	A	0.00411	0.00372	0.00515
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00754	0.00750	0.00738

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__and2_1	0.00495	0.00504	2.81958
sky130_osu_sc_18T_ms__and2_2	0.00495	0.00504	5.38028
sky130_osu_sc_18T_ms__and2_4	0.00496	0.00505	10.14912
sky130_osu_sc_18T_ms__and2_6	0.00499	0.00505	14.76600
sky130_osu_sc_18T_ms__and2_8	0.00497	0.00506	18.88788
sky130_osu_sc_18T_ms__and2_l	0.00399	0.00408	2.04015

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.05894	0.09426
sky130_osu_sc_18T_ms__and2_2	0.00000	0.09428	0.09433
sky130_osu_sc_18T_ms__and2_4	0.00000	0.16495	0.18847
sky130_osu_sc_18T_ms__and2_6	0.00000	0.23563	0.28266
sky130_osu_sc_18T_ms__and2_8	0.00000	0.30631	0.37685
sky130_osu_sc_18T_ms__and2_l	0.00000	0.01571	0.02509

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)	0.06530	0.56312	6.74865
	B->Y (RR)	0.06995	0.58148	6.76104
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.07603	0.52153	6.78464
	B->Y (RR)	0.08070	0.53422	6.82840
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.10543	0.53993	7.08852
	B->Y (RR)	0.11004	0.54599	7.16012
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.13342	0.57431	7.32450
	B->Y (RR)	0.13796	0.57587	7.40258
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.16137	0.61367	7.55830
	B->Y (RR)	0.16595	0.61352	7.63879
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.07142	0.62526	6.93388
	B->Y (RR)	0.07630	0.64176	6.93684

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)	0.05815	0.58800	6.92299
	B->Y (FF)	0.06165	0.60196	6.95452
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.06617	0.55614	6.92353
	B->Y (FF)	0.07030	0.56760	6.96251
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.09073	0.57275	7.13976
	B->Y (FF)	0.09494	0.58375	7.18405
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.11768	0.60811	7.31558
	B->Y (FF)	0.12180	0.61582	7.35469
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.14224	0.63832	7.33916
	B->Y (FF)	0.14656	0.64498	7.37874
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.06242	0.61601	6.61243
	B->Y (FF)	0.06682	0.63134	6.65237

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	0.00409	0.00358	0.01651
	B	0.00000	0.00000	0.00000
	B	0.00415	0.00357	0.01114
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00805	0.00781	0.01546
	B	0.00000	0.00000	0.00000
	B	0.00813	0.00896	0.01099
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01663	0.01693	0.02327
	B	0.00000	0.00000	0.00000
	B	0.01672	0.01699	0.01963
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02531	0.02602	0.03202
	B	0.00000	0.00000	0.00000
	B	0.02531	0.02622	0.03041
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03389	0.03510	0.04191
	B	0.00000	0.00000	0.00000
	B	0.03401	0.03534	0.04076
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00306	0.00270	0.01199
	B	0.00000	0.00000	0.00000
	B	0.00314	0.00259	0.00739

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	0.01025	0.01075	0.02153
	B	0.00000	0.00000	0.00000
	B	0.01160	0.01191	0.02185
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01309	0.01400	0.02453
	B	0.00000	0.00000	0.00000
	B	0.01447	0.01511	0.02482
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01994	0.02179	0.03206
	B	0.00000	0.00000	0.00000
	B	0.02134	0.02278	0.03215
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02686	0.02978	0.04004
	B	0.00000	0.00000	0.00000
	B	0.02824	0.03061	0.03977
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03369	0.03744	0.04800
	B	0.00000	0.00000	0.00000
	B	0.03510	0.03807	0.04726
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00819	0.00845	0.01807
	B	0.00000	0.00000	0.00000
	B	0.00921	0.00949	0.01832

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)	-0.00371	-0.00373	-0.00374
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00371	-0.00374	-0.00374
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00371	-0.00374	-0.00374
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00373	-0.00376	-0.00376
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00371	-0.00373	-0.00374
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00288	-0.00289	-0.00290

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)	0.00374	0.00377	0.00375
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00374	0.00377	0.00375
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00374	0.00377	0.00376
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00376	0.00379	0.00378
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00374	0.00377	0.00376
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00289	0.00291	0.00291

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)	-0.00347	-0.00349	-0.00348
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00347	-0.00349	-0.00348
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00347	-0.00348	-0.00348
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00347	-0.00349	-0.00348
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00347	-0.00349	-0.00348
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00270	-0.00272	-0.00270

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)	0.00349	0.00353	0.00349
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00349	0.00353	0.00349
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00349	0.00353	0.00349
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00349	0.00353	0.00349
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00349	0.00353	0.00350
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00271	0.00272	0.00271

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__aoi21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__aoi21_l	0.00467	0.00488	0.00472	1.31094

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.02077	0.04709

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)	0.07298	0.94370	11.75590
	A1->Y (FR)	0.06202	0.89706	11.31780
	B0->Y (FR)	0.05348	0.88909	11.32440

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)	0.04164	0.57915	7.25248
	A1->Y (RF)	0.03696	0.56974	7.28465
	B0->Y (RF)	0.02635	0.56201	7.28761

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	0.00886	0.00877	0.00890
	A1	0.00000	0.00000	0.00000
	A1	0.00738	0.00730	0.00736
	B0	0.00704	0.00697	0.00742

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	0.00193	0.00166	0.00166
	A1	0.00000	0.00000	0.00000
	A1	0.00193	0.00165	0.00174
	B0	-0.00085	-0.00089	-0.00079

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00299	-0.00320	-0.00320
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00325	-0.00328	-0.00326
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00325	-0.00327	-0.00326

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)	0.00318	0.00320	0.00320
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00325	0.00328	0.00327
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00327	0.00328	0.00327

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)	-0.00296	-0.00317	-0.00316
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00320	-0.00323	-0.00321
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00352	-0.00355	-0.00355

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)	0.00314	0.00317	0.00316
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00321	0.00323	0.00322
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00355	0.00357	0.00356

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)	-0.00166	-0.00167	-0.00166

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)	0.00182	0.00182	0.00171

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__aoi22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_18T_ms__aoi22_1	0.00467	0.00488	0.00505	0.00480	1.21746

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.02250	0.09419

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)	0.09323	0.95855	11.48450
	A1->Y (FR)	0.08253	0.93016	11.27120
	B0->Y (FR)	0.05608	0.86808	10.84800
	B1->Y (FR)	0.06700	0.90096	11.11990

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)	0.05293	0.57910	6.97843
	A1->Y (RF)	0.04839	0.56991	7.00869
	B0->Y (RF)	0.02885	0.55117	6.99378
	B1->Y (RF)	0.03351	0.55561	6.96330

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	0.01098	0.01086	0.01091
	A1	0.00922	0.00910	0.00930
	B0	0.00753	0.00744	0.00883
	B1	0.00894	0.00886	0.01024

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00389	0.00361	0.00357
	A1	0.00392	0.00359	0.00364
	B0	-0.00051	-0.00059	-0.00046
	B1	-0.00041	-0.00053	-0.00047

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)	-0.00301	-0.00320	-0.00320
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00325	-0.00328	-0.00326
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00325	-0.00326	-0.00326
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00325	-0.00327	-0.00326

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00318	0.00322	0.00320
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00326	0.00328	0.00327
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00327	0.00328	0.00327
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00327	0.00328	0.00327

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00298	-0.00316	-0.00316
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00320	-0.00322	-0.00321
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00351	-0.00355	-0.00355
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00351	-0.00355	-0.00355

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)	0.00314	0.00317	0.00316
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00321	0.00323	0.00323
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00355	0.00358	0.00356
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00354	0.00358	0.00356

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)	-0.00166	-0.00168	-0.00167
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00166	-0.00167	-0.00167
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00362	-0.00364	-0.00365
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00362	-0.00364	-0.00365

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)	0.00189	0.00190	0.00173
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00166	0.00167	0.00167
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00365	0.00367	0.00366
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00365	0.00368	0.00366

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)	-0.00168	-0.00169	-0.00168
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00167	-0.00169	-0.00168
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00331	-0.00333	-0.00332
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00331	-0.00333	-0.00332

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)	0.00190	0.00190	0.00174
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00168	0.00169	0.00168
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00333	0.00336	0.00333
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00333	0.00336	0.00333

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__buf_1	0.00506	2.77921
sky130_osu_sc_18T_ms__buf_2	0.00506	5.38859
sky130_osu_sc_18T_ms__buf_4	0.00506	10.24319
sky130_osu_sc_18T_ms__buf_6	0.00096	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00508	19.33217
sky130_osu_sc_18T_ms__buf_l	0.00413	2.04544

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.04717	0.04717
sky130_osu_sc_18T_ms__buf_2	0.00000	0.07075	0.09426
sky130_osu_sc_18T_ms__buf_4	0.00000	0.11792	0.18845
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.21225	0.37682
sky130_osu_sc_18T_ms__buf_l	0.00000	0.01257	0.01257

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)**	0.05199	0.53658	6.57759
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.05870	0.48731	6.67028
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.07998	0.49328	6.95613
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.12051	0.54824	7.40477
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.05747	0.59847	6.81700

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)**	0.05535	0.57715	6.81245
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.06404	0.55148	6.93128
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.08866	0.57183	7.17114
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.14011	0.63727	7.44597
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.06041	0.60663	6.59965

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	0.00377	0.00323	0.00877
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00776	0.00742	0.01209
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01635	0.01654	0.02029
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03340	0.03480	0.04051
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00292	0.00250	0.00919

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	0.00987	0.01008	0.02068
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01271	0.01343	0.02349
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01963	0.02116	0.03086
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03340	0.03656	0.04614
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00797	0.00814	0.01757

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
	-0.00056	-0.00057	-0.00056

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
	0.00056	0.00057	0.00056

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffr_1	63.73620
sky130_osu_sc_18T_ms__dffr_l	63.73620

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_18T_ms__dffr_1	0.00481	0.00479	0.01419	2.68410	2.67158
sky130_osu_sc_18T_ms__dffr_l	0.00481	0.00479	0.01417	2.03256	2.03128

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.13095	0.21552
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.09636	0.18092

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)	0.24638	1.30019	16.08380
	QN->Q (FR)	0.03002	0.83498	12.82580
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.24207	1.39008	15.90620
	QN->Q (FR)	0.03133	0.86046	12.42850

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)	0.25816	1.34585	16.69400
	QN->Q (RF)	0.02559	0.72325	11.09790
	RN->Q (FF)	0.18964	1.40248	18.21680
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.25968	1.45516	16.65820
	QN->Q (RF)	0.02594	0.72991	10.53410
	RN->Q (FF)	0.19145	1.51129	18.17200

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)	0.22688	0.73855	6.68534
	RN->QN (FR)	0.15830	0.79561	8.20501
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.22595	0.78955	6.83603
	RN->QN (FR)	0.15760	0.84611	8.34405

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)**	0.20599	0.65497	5.49904
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.19947	0.67599	5.41339

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)	-0.04605	-0.07764	-0.37413
	setup	CK (R)	0.19480	0.23890	1.54281
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.04598	-0.07769	-0.37410
	setup	CK (R)	0.19236	0.24291	1.56944

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)	-0.10152	-0.39205	-3.33989
	setup	CK (R)	0.13193	0.40665	4.12792
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.10410	-0.39333	-3.26954
	setup	CK (R)	0.13189	0.40665	4.12646

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)	-0.04605	-0.07764	-0.37413
	setup	CK (R)	0.19480	0.23890	1.54281
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.04598	-0.07769	-0.37410
	setup	CK (R)	0.19236	0.24291	1.56944

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)	-0.10152	-0.39205	-3.33989
	setup	CK (R)	0.13193	0.40665	4.12792
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.10410	-0.39333	-3.26954
	setup	CK (R)	0.13189	0.40665	4.12646

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)	0.16449	0.19653	1.42412
	removal	CK (R)	-0.02087	-0.02439	-0.07428
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.16217	0.19646	1.43452
	removal	CK (R)	-0.02087	-0.02439	-0.07428

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)	0.16449	0.19653	1.42412
	removal	CK (R)	-0.02087	-0.02439	-0.07428
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.16217	0.19646	1.43452
	removal	CK (R)	-0.02087	-0.02439	-0.07428

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 ()	0.11299	0.49805	13.33370
	min_pulse_width	RN ()	0.11673	0.49805	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.11299	0.49805	13.33370
	min_pulse_width	RN ()	0.11299	0.49805	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 ()	0.10551	0.49805	13.33370
	min_pulse_width	CK ()	0.13542	0.49805	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.10178	0.49805	13.33370
	min_pulse_width	CK ()	0.13542	0.49805	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 ()	0.24757	0.49805	13.33370
	min_pulse_width	CK ()	0.10551	0.49805	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.24757	0.49805	13.33370
	min_pulse_width	CK ()	0.10551	0.49805	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	0.01020	0.00610	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00918	0.00612	0.00000

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	0.01139	0.00911	0.00000
	RN	-0.00136	-0.09576	-1.63300
	RN	0.02621	0.02412	0.00002
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01037	0.00862	0.00000
	RN	-0.00136	-0.08105	-1.23661
	RN	0.02518	0.02361	0.01122

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	0.01139	0.00911	0.00000
	RN	-0.00136	-0.09550	-1.62530
	RN	0.02621	0.02410	0.00016
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01037	0.00863	0.00000
	RN	-0.00136	-0.08102	-1.23581
	RN	0.02518	0.02362	0.01075

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	0.01016	0.00608	0.00000
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00914	0.00611	0.00000

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	-0.00281	-0.00317	-0.00319
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01258	0.01192	0.01356
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00558	0.00499	0.00683
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00281	-0.00317	-0.00319
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01259	0.01192	0.01356
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00558	0.00500	0.00683

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	0.00316	0.00320	0.00319
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01987	0.01952	0.02184
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00930	0.00903	0.01138
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00316	0.00320	0.00319
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01987	0.01952	0.02184
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00930	0.00903	0.01138

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)	0.00404	0.00344	0.01203
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01132	0.01039	0.01878
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00404	0.00344	0.01203
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01132	0.01039	0.01877

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)	0.00934	0.00931	0.02089
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01956	0.01909	0.03058
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00934	0.00931	0.02089
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01956	0.01909	0.03058

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)	-0.00059	-0.00131	0.00705
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00602	0.00442	0.01266
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00103	-0.00170	0.00646
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00059	-0.00131	0.00705
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00602	0.00442	0.01266
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00104	-0.00177	0.00646

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)	0.01454	0.01454	0.02613
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03124	0.03018	0.04169
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02360	0.02289	0.03376
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03052	0.03021	0.05193
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01600	0.01597	0.02717
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01454	0.01454	0.02613
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03124	0.03018	0.04169
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02360	0.02289	0.03376
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03052	0.03021	0.05193
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01600	0.01597	0.02717

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffsr_1	69.59700
sky130_osu_sc_18T_ms__dffsr_l	69.59700

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_18T_ms__dffsr_1	0.00477	0.00480	0.01036	0.01449	2.85135	2.81734
sky130_osu_sc_18T_ms__dffsr_l	0.00477	0.00480	0.01035	0.01448	2.03561	2.03800

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.15354	0.21561
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.11894	0.18101

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)	0.26391	1.31346	16.26630
	QN->Q (FR)	0.02837	0.81445	12.68230
	RN->Q (RR)	0.21194	1.27216	16.26570
	SN->Q (FR)	0.19592	1.42032	18.38820
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.26654	1.42734	16.04340
	QN->Q (FR)	0.03126	0.85793	12.39820
	RN->Q (RR)	0.21507	1.38662	16.03990
	SN->Q (FR)	0.19883	1.53104	18.14280

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)	0.28754	1.36321	16.86190
	QN->Q (RF)	0.02317	0.68175	10.58320
	RN->Q (FF)	0.19292	1.39688	18.37720
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.29302	1.49093	16.70760
	QN->Q (RF)	0.02589	0.72961	10.52900
	RN->Q (FF)	0.19847	1.52274	18.20730

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)	0.25736	0.76765	6.78096
	RN->QN (FR)	0.16319	0.80079	8.28844
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.25880	0.82579	6.89250
	RN->QN (FR)	0.16457	0.85839	8.40471

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)	0.22608	0.67920	5.59085
	RN->QN (RF)	0.17448	0.63796	5.58819
	SN->QN (FF)	0.15847	0.78670	7.69706
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.22453	0.71450	5.56634
	RN->QN (RF)	0.17336	0.67419	5.56171
	SN->QN (FF)	0.15718	0.81960	7.65262

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)	-0.04961	-0.08957	-0.46769
	setup	CK (R)	0.20108	0.24276	1.42153
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.04961	-0.08957	-0.46776
	setup	CK (R)	0.20081	0.24569	1.42384

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)	-0.11702	-0.41014	-4.05007
	setup	CK (R)	0.14892	0.42173	4.22822
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11421	-0.40739	-4.04557
	setup	CK (R)	0.14864	0.42173	4.22939

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)	-0.04961	-0.08957	-0.46769
	setup	CK (R)	0.20108	0.24276	1.42153
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.04961	-0.08957	-0.46776
	setup	CK (R)	0.20081	0.24569	1.42384

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)	-0.11702	-0.41014	-4.05007
	setup	CK (R)	0.14892	0.42173	4.22822
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11421	-0.40739	-4.04557
	setup	CK (R)	0.14864	0.42173	4.22939

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)	0.15571	0.18401	1.26202
	removal	CK (R)	-0.01604	-0.02155	-0.08332
	hold	SN (R)	-0.15191	-0.36554	-2.11109
	setup	SN (R)	0.17492	0.41937	6.09332
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.15579	0.18308	1.25577
	removal	CK (R)	-0.01604	-0.02155	-0.08332
	hold	SN (R)	-0.15154	-0.35923	-2.07737
	setup	SN (R)	0.17572	0.41502	6.02050

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)	0.15571	0.18401	1.26202
	removal	CK (R)	-0.01604	-0.02155	-0.08332
	hold	SN (R)	-0.15191	-0.36554	-2.11109
	hold	SN (R)	-0.15420	-0.36695	-2.11993
	setup	SN (R)	0.17492	0.41937	5.88977
	setup	SN (R)	0.17005	0.41885	6.09332
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.15579	0.18308	1.25577
	removal	CK (R)	-0.01604	-0.02155	-0.08332
	hold	SN (R)	-0.15270	-0.35923	-2.07737
	hold	SN (R)	-0.15154	-0.36030	-2.09012
	setup	SN (R)	0.17572	0.41363	5.80881
	setup	SN (R)	0.16598	0.41502	6.02050

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 ()	0.12795	0.49805	13.33370
	min_pulse_width	RN ()	0.12795	0.49805	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.12795	0.49805	13.33370
	min_pulse_width	RN ()	0.12421	0.49805	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)	0.03576	0.07619	5.08669
	removal	CK (R)	-0.01021	-0.05339	-0.35689
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.03607	0.07477	4.98114
	removal	CK (R)	-0.01021	-0.05339	-0.35689

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)	0.03576	0.07619	5.08669
	removal	CK (R)	-0.01021	-0.05339	-0.35689
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.03607	0.07477	4.98114
	removal	CK (R)	-0.01021	-0.05339	-0.35689

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 ()	0.15785	0.49805	13.33370
	min_pulse_width	SN ()	0.15411	0.49805	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.15785	0.49805	13.33370
	min_pulse_width	SN ()	0.15038	0.49805	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 ()	0.12047	0.49805	13.33370
	min_pulse_width	CK ()	0.15038	0.49805	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.11673	0.49805	13.33370
	min_pulse_width	CK ()	0.15038	0.49805	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 ()	0.25879	0.49805	13.33370
	min_pulse_width	CK ()	0.12795	0.49805	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.25879	0.49805	13.33370
	min_pulse_width	CK ()	0.12421	0.49805	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	0.01251	0.00956	0.00000
	RN	0.02292	0.02012	-0.00438
	SN	-0.00136	-0.09930	-1.73476
	SN	0.02526	0.02248	-0.01718
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01159	0.00858	0.00000
	RN	0.02199	0.01917	-0.01151
	SN	-0.00136	-0.08112	-1.23847
	SN	0.02433	0.02152	-0.01252

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	0.01314	0.01120	0.00000
	RN	-0.00136	-0.09930	-1.73476
	RN	0.02685	0.02500	0.00512
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01224	0.01060	0.00000
	RN	-0.00136	-0.08112	-1.23847
	RN	0.02593	0.02438	0.01247

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	0.01313	0.01120	0.00000
	RN	-0.00136	-0.09859	-1.71405
	RN	0.02684	0.02500	0.00438
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01223	0.01061	0.00000
	RN	-0.00136	-0.08118	-1.23990
	RN	0.02592	0.02437	0.01187

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	0.01246	0.00954	0.00000
	RN	0.02288	0.02011	-0.00394
	SN	-0.00136	-0.09859	-1.71402
	SN	0.02522	0.02248	-0.01646
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01155	0.00855	0.00000
	RN	0.02195	0.01913	-0.01187
	SN	-0.00136	-0.08118	-1.23988
	SN	0.02428	0.02149	-0.01201

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	-0.00309	-0.00319	-0.00318
	(!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)	0.01568	0.01504	0.01669
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00603	0.00547	0.00721
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00601	0.00545	0.00721
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00607	0.00551	0.00725
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00309	-0.00319	-0.00318
	(!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)	0.01568	0.01504	0.01669
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00603	0.00547	0.00721
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00601	0.00545	0.00721
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00607	0.00551	0.00725

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	0.00317	0.00319	0.00318
	(!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)	0.02257	0.02217	0.02414
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00984	0.00962	0.01192
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00991	0.00967	0.01193
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00980	0.00958	0.01187
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00317	0.00319	0.00318
	(!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)	0.02256	0.02216	0.02417
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00983	0.00961	0.01191
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00990	0.00966	0.01192
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00979	0.00957	0.01186

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)	0.00335	0.00276	0.01119
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01325	0.01229	0.02071
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)	0.00335	0.00276	0.01120
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01325	0.01229	0.02071

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)	0.01003	0.01010	0.02181
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02056	0.02007	0.03132
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)	0.01001	0.01009	0.02180
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02055	0.02005	0.03131

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)	-0.00736	-0.00743	-0.00742
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00730	-0.00762	-0.00761
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00710	-0.00727	-0.00728
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00498	0.00436	0.00653
sky130_osu_sc_18T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00736	-0.00743	-0.00742
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00728	-0.00760	-0.00760
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00709	-0.00727	-0.00728
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00498	0.00437	0.00653

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)	0.00741	0.00745	0.00744
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00757	0.00764	0.00762
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00726	0.00733	0.00730
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01582	0.01543	0.01738
sky130_osu_sc_18T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00741	0.00745	0.00744
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00755	0.00762	0.00760
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00726	0.00732	0.00729
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01581	0.01542	0.01737

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)	-0.00059	-0.00131	0.00704
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00681	0.00526	0.01347
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00671	0.00517	0.01341
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00084	-0.00150	0.00664
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00446	0.00304	0.02020
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00059	-0.00131	0.00704
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00680	0.00525	0.01347
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00670	0.00516	0.01340
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00084	-0.00150	0.00664
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00445	0.00304	0.02021

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)	0.03449	0.03349	0.04481
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01458	0.01459	0.02617
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02381	0.02314	0.03404
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02387	0.02319	0.03405
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03317	0.03271	0.05416
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01585	0.01587	0.02702
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01916	0.01909	0.04144
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03449	0.03350	0.04482
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01458	0.01459	0.02617
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02381	0.02314	0.03404
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02387	0.02319	0.03405
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03316	0.03270	0.05414
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01585	0.01587	0.02702
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01915	0.01909	0.04143

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffs_1	57.87540
sky130_osu_sc_18T_ms__dffs_l	57.87540

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffs_1	0.00480	0.00858	0.01423	2.73678	2.72220
sky130_osu_sc_18T_ms__dffs_l	0.00480	0.00858	0.01423	2.05591	2.04571

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.11639	0.16834
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.08180	0.13375

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RR)	0.18829	1.24248	16.23520
	QN->Q (FR)	0.02983	0.83358	12.85240
	SN->Q (FR)	0.14710	1.34927	17.69990
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.18793	1.33425	15.95830
	QN->Q (FR)	0.03116	0.85770	12.42680
	SN->Q (FR)	0.14631	1.43433	17.41720

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RF)	0.27992	1.37793	16.95290
	QN->Q (RF)	0.02537	0.72392	11.16750
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.27972	1.48115	16.80540
	QN->Q (RF)	0.02577	0.73009	10.56090

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RR)	0.24755	0.76481	6.78416
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.24508	0.81208	6.87064

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RF)	0.15189	0.59424	5.50273
	SN->QN (FF)	0.11036	0.69988	6.96139
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.14901	0.61877	5.36232
	SN->QN (FF)	0.10701	0.71883	6.81278

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.03503	-0.06570	-0.32406
	setup	CK (R)	0.13317	0.18520	1.64058
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.03429	-0.06570	-0.32806
	setup	CK (R)	0.13258	0.18490	1.66309

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.10520	-0.39423	-2.49754
	setup	CK (R)	0.14233	0.41065	4.15369
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.10714	-0.39423	-2.23377
	setup	CK (R)	0.14234	0.41065	4.15368

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.03503	-0.06570	-0.32406
	setup	CK (R)	0.13317	0.18520	1.64058
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.03429	-0.06570	-0.32806
	setup	CK (R)	0.13258	0.18490	1.66309

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)	-0.10520	-0.39423	-2.49754
	setup	CK (R)	0.14233	0.41065	4.15369
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.10714	-0.39423	-2.23377
	setup	CK (R)	0.14234	0.41065	4.15368

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)	0.03913	0.07427	4.24236
	removal	CK (R)	-0.01504	-0.04723	-0.45816
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03910	0.07433	4.11478
	removal	CK (R)	-0.01504	-0.04723	-0.45816

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)	0.03913	0.07427	4.24236
	removal	CK (R)	-0.01504	-0.04723	-0.45816
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.03910	0.07433	4.11478
	removal	CK (R)	-0.01504	-0.04723	-0.45816

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 ()	0.09804	0.49805	13.33370
	min_pulse_width	SN ()	0.10178	0.49805	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.09804	0.49805	13.33370
	min_pulse_width	SN ()	0.09804	0.49805	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 ()	0.07935	0.49805	13.33370
	min_pulse_width	CK ()	0.14290	0.49805	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.07561	0.49805	13.33370
	min_pulse_width	CK ()	0.13916	0.49805	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 ()	0.18776	0.49805	13.33370
	min_pulse_width	CK ()	0.12047	0.49805	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.18776	0.49805	13.33370
	min_pulse_width	CK ()	0.12047	0.49805	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01020	0.00597	0.00000
	SN	-0.00136	-0.09689	-1.66506
	SN	0.02207	0.01807	-0.03183
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00917	0.00609	0.00000
	SN	-0.00136	-0.08161	-1.25081
	SN	0.02104	0.01811	-0.00818

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01132	0.00916	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01031	0.00866	0.00000

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01132	0.00916	0.00000
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01030	0.00867	0.00000

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01016	0.00602	0.00000
	SN	-0.00136	-0.09658	-1.65608
	SN	0.02203	0.01804	-0.03033
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00914	0.00607	0.00000
	SN	-0.00136	-0.08136	-1.24457
	SN	0.02100	0.01808	-0.00824

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00323	-0.00322
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01217	0.01144	0.01322
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00542	0.00484	0.00666
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00323	-0.00322
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01217	0.01143	0.01323
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00542	0.00484	0.00666

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00321	0.00323	0.00322
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01928	0.01883	0.02108
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00943	0.00919	0.01157
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00321	0.00323	0.00322
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01928	0.01883	0.02108
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00943	0.00919	0.01157

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00573	-0.00577	-0.00577
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00379	0.00326	0.01066
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)	-0.00574	-0.00577	-0.00577
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00379	0.00326	0.01066

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)	0.00577	0.00585	0.00579
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01147	0.01127	0.02074
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)	0.00577	0.00585	0.00579
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01147	0.01127	0.02074

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)	-0.00060	-0.00133	0.00704
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00095	-0.00168	0.00656
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00381	0.00242	0.02000
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00060	-0.00133	0.00704
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00095	-0.00168	0.00656
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00381	0.00242	0.02000

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)	0.03087	0.02981	0.04149
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01454	0.01455	0.02614
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02983	0.02931	0.05110
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01590	0.01593	0.02708
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01867	0.01865	0.04120
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03087	0.02980	0.04149
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01454	0.01455	0.02614
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02983	0.02930	0.05110
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01590	0.01593	0.02708
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01867	0.01865	0.04120

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dff_1	48.35160
sky130_osu_sc_18T_ms__dff_l	48.35160

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_18T_ms__dff_1	0.00495	0.01399	2.87278	2.84256
sky130_osu_sc_18T_ms__dff_l	0.00495	0.01397	2.02610	2.00928

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.14340	0.18876
sky130_osu_sc_18T_ms__dff_l	0.00000	0.10881	0.15417

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)	0.16943	1.20408	16.14210
	QN->Q (FR)	0.02814	0.81217	12.66730
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.17533	1.32320	15.85220
	QN->Q (FR)	0.03182	0.87023	12.55880

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)	0.24086	1.31372	16.87300
	QN->Q (RF)	0.02305	0.68060	10.58980
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.24849	1.44911	16.71030
	QN->Q (RF)	0.02583	0.72737	10.47560

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)	0.21174	0.71761	6.74608
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.21488	0.78046	6.83134

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)	0.13576	0.57076	5.42554
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.13687	0.60602	5.28474

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)	-0.03411	-0.06570	-0.36234
	setup	CK (R)	0.11438	0.16880	1.60571
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.03411	-0.06570	-0.36329
	setup	CK (R)	0.11343	0.16794	1.61195

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)	-0.09368	-0.39023	-2.43346
	setup	CK (R)	0.11864	0.40665	4.14205
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.09386	-0.39023	-2.50342
	setup	CK (R)	0.11860	0.40665	4.14200

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 ()	0.07561	0.49805	13.33370
	min_pulse_width	CK ()	0.13168	0.49805	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.07187	0.49805	13.33370
	min_pulse_width	CK ()	0.12795	0.49805	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 ()**	0.16907	0.49805	13.33370
	min_pulse_width	**CK ()**	0.09430	0.49805	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.16533	0.49805	13.33370
	min_pulse_width	**CK ()**	0.09430	0.49805	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	0.01062	0.00752	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00970	0.00655	0.00000

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	0.01150	0.00957	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01061	0.00884	0.00000

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	0.01149	0.00959	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01060	0.00885	0.00000

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	0.01058	0.00749	0.00000
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00966	0.00660	0.00000

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	-0.00281	-0.00317	-0.00318
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01111	0.01051	0.01241
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00281	-0.00317	-0.00318
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01111	0.01052	0.01241

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	0.00315	0.00318	0.00318
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01980	0.01934	0.02167
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00315	0.00318	0.00318
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01981	0.01937	0.02167

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)	-0.00061	-0.00129	0.00706
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00094	-0.00166	0.00659
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00061	-0.00129	0.00706
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00094	-0.00166	0.00661

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)	0.01449	0.01450	0.02609
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02986	0.02890	0.04065
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03024	0.02977	0.05152
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01583	0.01586	0.02702
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01449	0.01450	0.02609
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02987	0.02891	0.04065
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03025	0.02977	0.05152
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01583	0.01586	0.02702

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__inv_1	0.00483	2.65439
sky130_osu_sc_18T_ms__inv_10	0.04530	23.18471
sky130_osu_sc_18T_ms__inv_2	0.00925	5.18744
sky130_osu_sc_18T_ms__inv_3	0.01378	7.37992
sky130_osu_sc_18T_ms__inv_4	0.01823	9.93169
sky130_osu_sc_18T_ms__inv_6	0.02733	14.67067
sky130_osu_sc_18T_ms__inv_8	0.03632	19.09407
sky130_osu_sc_18T_ms__inv_l	0.00388	1.92922

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.02358	0.04709
sky130_osu_sc_18T_ms__inv_10	0.00000	0.23583	0.47093
sky130_osu_sc_18T_ms__inv_2	0.00000	0.04717	0.09419
sky130_osu_sc_18T_ms__inv_3	0.00000	0.07075	0.14128
sky130_osu_sc_18T_ms__inv_4	0.00000	0.09433	0.18837
sky130_osu_sc_18T_ms__inv_6	0.00000	0.14150	0.28256
sky130_osu_sc_18T_ms__inv_8	0.00000	0.18867	0.37675
sky130_osu_sc_18T_ms__inv_l	0.00000	0.00629	0.01252

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)**	0.02632	0.73007	11.10120
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.04436	0.52957	11.14100
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.02237	0.64197	11.07950
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.02518	0.60801	11.09650
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.02646	0.58244	11.07450
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.03097	0.55382	11.13640
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.03726	0.53642	11.10890
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.02925	0.77973	11.13450

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)**	0.02037	0.58354	8.93964
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.03492	0.38409	8.69299
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.01756	0.50800	8.88118
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.01942	0.47547	8.88427
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.01984	0.44569	8.87985
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.02505	0.41914	8.88971
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.02995	0.40017	8.81739
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.02257	0.62442	8.92966

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	0.00502	0.00516	0.00496
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04334	0.04626	0.01926
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00900	0.00952	0.01053
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01377	0.01480	0.01401
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01775	0.01881	0.01603
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02630	0.02806	0.02195
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03479	0.03834	0.03933
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00404	0.00364	0.00320

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	-0.00101	-0.00100	-0.00085
sky130_osu_sc_18T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01722	-0.01674	-0.01301
sky130_osu_sc_18T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00332	-0.00317	-0.00276
sky130_osu_sc_18T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00442	-0.00411	-0.00346
sky130_osu_sc_18T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00686	-0.00646	-0.00538
sky130_osu_sc_18T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01041	-0.00984	-0.00799
sky130_osu_sc_18T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01403	-0.01308	-0.01047
sky130_osu_sc_18T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00079	-0.00078	-0.00060

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__mux2_1	18.31500

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_18T_ms__mux2_1	0.31738	0.31732	0.00984	0.31269

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.04746	0.04808

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)	-	0.01505	0.30922	3.28532
	A1->Y (RR)	-	0.01598	0.30957	3.28240
	S0->Y (RR)	(!A0 * A1)	0.04437	0.24911	0.76567
	S0->Y (FR)	(A0 * !A1)	0.03934	0.39569	3.22985

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)	-	0.01352	0.27504	2.77099
	A1->Y (FF)	-	0.01341	0.27359	2.76342
	S0->Y (FF)	(!A0 * A1)	0.05796	0.35617	2.22585
	S0->Y (RF)	(A0 * !A1)	0.02429	0.28071	1.92906

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	-	-0.00551	-0.00552	-0.00553
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00373	-0.00374	-0.00374
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00613	0.00631	0.01874
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00352	-0.00406	0.00583

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	-	0.00552	0.00553	0.00553
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00373	0.00374	0.00374
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00109	0.00060	0.01105
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01372	0.01390	0.02573

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)	-0.00142	-0.00142	-0.00142

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)	0.00142	0.00142	0.00142

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)	-0.00169	-0.00168	-0.00169

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)	0.00169	0.00168	0.00169

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)	-0.00125	-0.00175	0.00850
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00119	-0.00170	0.00861

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)	0.01029	0.01050	0.02239
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00955	0.00981	0.02206

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nand2_1	9.52380
sky130_osu_sc_18T_ms__nand2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00485	0.00480	2.59703
sky130_osu_sc_18T_ms__nand2_l	0.00389	0.00386	1.86235

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.02360	0.09419
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.00631	0.02504

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)	0.02681	0.73214	11.07680
	B->Y (FR)	0.03168	0.72859	10.93940
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.02961	0.77610	10.99670
	B->Y (FR)	0.03549	0.77749	10.93810

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)	0.02751	0.70124	10.83100
	B->Y (RF)	0.03189	0.71221	10.87830
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.03072	0.75663	10.74440
	B->Y (RF)	0.03485	0.76827	10.78330

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	0.00535	0.00548	0.00490
	B	0.00000	0.00000	0.00000
	B	0.00684	0.00688	0.00788
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00426	0.00385	0.00520
	B	0.00000	0.00000	0.00000
	B	0.00538	0.00491	0.00623

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	-0.00062	-0.00065	-0.00052
	B	0.00000	0.00000	0.00000
	B	-0.00057	-0.00061	-0.00054
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00056	-0.00059	-0.00040
	B	0.00000	0.00000	0.00000
	B	-0.00052	-0.00057	-0.00047

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)	-0.00364	-0.00366	-0.00367
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00280	-0.00281	-0.00282

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)	0.00367	0.00369	0.00368
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00281	0.00283	0.00283

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)	-0.00335	-0.00336	-0.00335
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00257	-0.00259	-0.00258

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)	0.00336	0.00338	0.00336
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00258	0.00259	0.00259

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nor2_1	9.52380
sky130_osu_sc_18T_ms__nor2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nor2_1	0.00485	0.00515	1.37742
sky130_osu_sc_18T_ms__nor2_l	0.00382	0.00415	1.04580

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.01523	0.04709
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.00416	0.01252

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)	0.05427	0.89797	11.54850
	B->Y (FR)	0.04159	0.84355	11.00820
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.05817	0.94260	11.29610
	B->Y (FR)	0.04716	0.91235	11.08430

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)	0.02661	0.48758	6.33663
	B->Y (RF)	0.02148	0.48121	6.31888
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.02881	0.52578	6.45642
	B->Y (RF)	0.02382	0.52022	6.44110

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	0.00714	0.00709	0.00723
	B	0.00000	0.00000	0.00000
	B	0.00553	0.00556	0.00698
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00550	0.00545	0.00561
	B	0.00000	0.00000	0.00000
	B	0.00438	0.00439	0.00564

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	0.00080	0.00056	0.00069
	B	0.00000	0.00000	0.00000
	B	-0.00081	-0.00083	-0.00068
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00052	0.00036	0.00060
	B	0.00000	0.00000	0.00000
	B	-0.00058	-0.00060	-0.00037

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)	-0.00283	-0.00319	-0.00320
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00212	-0.00237	-0.00239

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)	0.00318	0.00321	0.00320
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00237	0.00242	0.00239

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)	-0.00166	-0.00168	-0.00167
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00123	-0.00124	-0.00124

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)	0.00175	0.00176	0.00170
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00129	0.00130	0.00126

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__oai21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__oai21_l	0.00488	0.00494	0.00431	1.39427

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.01235	0.05961

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)	0.05595	0.86958	11.19530
	A1->Y (FR)	0.07254	0.92759	11.74050
	B0->Y (FR)	0.03605	0.70951	9.32476

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)	0.03968	0.61538	7.89057
	A1->Y (RF)	0.04568	0.60782	7.70599
	B0->Y (RF)	0.03109	0.62037	8.20251

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	0.00758	0.00752	0.00877
	A1	0.00000	0.00000	0.00000
	A1	0.00922	0.00908	0.00922
	B0	0.00631	0.00632	0.00763

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	0.00037	0.00025	0.00030
	A1	0.00000	0.00000	0.00000
	A1	0.00193	0.00170	0.00172
	B0	0.00249	0.00238	0.00258

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)	-0.00167	-0.00168	-0.00167
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00313	-0.00323	-0.00322
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00327	-0.00329	-0.00328

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)	0.00175	0.00176	0.00170
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00320	0.00323	0.00322
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00327	0.00334	0.00329

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)	-0.00279	-0.00314	-0.00314
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00311	-0.00320	-0.00319
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00323	-0.00324	-0.00324

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)	0.00311	0.00315	0.00314
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00317	0.00320	0.00319
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00323	0.00330	0.00325

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)	-0.00286	-0.00288	-0.00291

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)	0.00291	0.00293	0.00292

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__oai22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__oai22_1	0.00473	0.00499	0.00515	0.00503	1.40150

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.02287	0.09419

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (FR)	0.07854	0.93134	11.72430
	A1->Y (FR)	0.06586	0.87609	11.18350
	B0->Y (FR)	0.04679	0.85777	11.18370
	B1->Y (FR)	0.05988	0.91304	11.72740

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (RF)	0.06448	0.65640	8.06982
	A1->Y (RF)	0.05232	0.63408	7.95995
	B0->Y (RF)	0.04316	0.64106	8.24755
	B1->Y (RF)	0.05665	0.67093	8.51805

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	0.01191	0.01179	0.01191
	A1	0.01027	0.01019	0.01139
	B0	0.00759	0.00758	0.00881
	B1	0.00931	0.00921	0.00936

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00301	0.00279	0.00278
	A1	0.00157	0.00140	0.00141
	B0	-0.00026	-0.00033	-0.00020
	B1	0.00304	0.00278	0.00284

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)	-0.00282	-0.00319	-0.00320
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00282	-0.00319	-0.00320
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00311	-0.00321	-0.00319
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00324	-0.00325	-0.00325

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)	0.00317	0.00321	0.00320
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00317	0.00321	0.00320
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00317	0.00322	0.00319
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00325	0.00328	0.00326

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)	-0.00165	-0.00167	-0.00166
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00165	-0.00167	-0.00166
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00309	-0.00319	-0.00318
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00323	-0.00326	-0.00324

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)	0.00174	0.00175	0.00169
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00174	0.00175	0.00169
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00316	0.00319	0.00318
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00323	0.00327	0.00325

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)	-0.00164	-0.00165	-0.00165
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00164	-0.00165	-0.00165
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00349	-0.00361	-0.00359
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00356	-0.00360	-0.00364

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)	0.00173	0.00174	0.00168
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00173	0.00174	0.00168
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00359	0.00365	0.00359
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00364	0.00366	0.00365

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)	-0.00278	-0.00314	-0.00315
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00278	-0.00314	-0.00315
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00356	-0.00367	-0.00365
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00362	-0.00363	-0.00369

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)	0.00313	0.00316	0.00315
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00313	0.00314	0.00315
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00366	0.00369	0.00365
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00369	0.00371	0.00371

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__or2_1	0.00519	0.00497	2.75274
sky130_osu_sc_18T_ms__or2_2	0.00519	0.00498	5.34746
sky130_osu_sc_18T_ms__or2_4	0.00519	0.00498	10.13429
sky130_osu_sc_18T_ms__or2_8	0.00519	0.00500	18.87636
sky130_osu_sc_18T_ms__or2_l	0.00422	0.00397	1.98649

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.02706	0.04724
sky130_osu_sc_18T_ms__or2_2	0.00000	0.03889	0.09433
sky130_osu_sc_18T_ms__or2_4	0.00000	0.06255	0.18852
sky130_osu_sc_18T_ms__or2_8	0.00000	0.10986	0.37689
sky130_osu_sc_18T_ms__or2_l	0.00000	0.00733	0.01263

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)	0.06003	0.56533	6.53801
	B->Y (RR)	0.05355	0.53956	6.50753
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.06714	0.51356	6.69323
	B->Y (RR)	0.06051	0.49209	6.64706
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.08871	0.51513	7.01769
	B->Y (RR)	0.08201	0.49717	6.96397
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.12907	0.56446	7.44857
	B->Y (RR)	0.12234	0.55267	7.39864
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.06618	0.62883	6.72645
	B->Y (RR)	0.05956	0.60401	6.71737

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)	0.09924	0.68693	7.27950
	B->Y (FF)	0.08201	0.62184	6.90356
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.11882	0.66780	7.47038
	B->Y (FF)	0.10162	0.61009	7.02020
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.16657	0.70501	7.80729
	B->Y (FF)	0.14939	0.65580	7.30702
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.26309	0.80636	8.12208
	B->Y (FF)	0.24591	0.75974	7.59112
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.10616	0.70068	6.84448
	B->Y (FF)	0.08926	0.65190	6.63468

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	0.00559	0.00481	0.00714
	B	0.00000	0.00000	0.00000
	B	0.00410	0.00369	0.00939
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00960	0.00913	0.01117
	B	0.00000	0.00000	0.00000
	B	0.00805	0.00806	0.01289
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01818	0.01834	0.02072
	B	0.00000	0.00000	0.00000
	B	0.01663	0.01737	0.02167
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03528	0.03647	0.04127
	B	0.00000	0.00000	0.00000
	B	0.03369	0.03575	0.04220
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00424	0.00360	0.00705
	B	0.00000	0.00000	0.00000
	B	0.00325	0.00296	0.00936

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	0.01195	0.01176	0.01393
	B	0.00000	0.00000	0.00000
	B	0.01008	0.01057	0.02101
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01475	0.01510	0.01708
	B	0.00000	0.00000	0.00000
	B	0.01285	0.01374	0.02361
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02159	0.02296	0.02483
	B	0.00000	0.00000	0.00000
	B	0.01968	0.02136	0.03059
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03563	0.03830	0.04070
	B	0.00000	0.00000	0.00000
	B	0.03412	0.03656	0.04546
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00946	0.00927	0.01223
	B	0.00000	0.00000	0.00000
	B	0.00803	0.00845	0.01811

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)	-0.00287	-0.00321	-0.00321
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00287	-0.00321	-0.00321
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00287	-0.00321	-0.00321
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00287	-0.00321	-0.00321
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00214	-0.00238	-0.00240

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)	0.00319	0.00322	0.00321
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00319	0.00322	0.00321
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00319	0.00321	0.00321
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00319	0.00321	0.00321
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00238	0.00238	0.00240

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)	-0.00167	-0.00168	-0.00168
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00167	-0.00168	-0.00168
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00167	-0.00168	-0.00168
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00167	-0.00168	-0.00168
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00126	-0.00126	-0.00126

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)	0.00176	0.00177	0.00170
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00177	0.00171
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00178	0.00171
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00178	0.00171
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00131	0.00132	0.00128

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tbufi_1	12.45420
sky130_osu_sc_18T_ms__tbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tbufi_1	0.00515	0.00662	1.37823
sky130_osu_sc_18T_ms__tbufi_l	0.00416	0.00535	1.02894

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.02364	0.09419
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.00633	0.02504

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)	0.03957	0.84180	11.00760
	OE->Y (FR)	0.04134	0.33274	4.59530
	OE->Y (RR)	0.07144	0.66913	6.70092
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.04513	0.90685	10.99230
	OE->Y (FR)	0.04423	0.33237	4.59509
	OE->Y (RR)	0.07680	0.74164	6.85465

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)	0.02650	0.57005	7.48071
	OE->Y (FF)	0.04159	0.33272	4.59532
	OE->Y (RF)	0.02715	0.57125	7.44862
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.03008	0.61137	7.57322
	OE->Y (FF)	0.04448	0.33242	4.59510
	OE->Y (RF)	0.03094	0.61821	7.53839

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	0.00511	0.00515	0.00646
	OE	0.00000	0.00000	0.00000
	OE	0.00505	0.00461	0.01304
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00407	0.00410	0.00526
	OE	0.00000	0.00000	0.00000
	OE	0.00380	0.00371	0.01345

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	-0.00082	-0.00084	-0.00069
	OE	0.00000	0.00000	0.00000
	OE	0.00352	0.00304	0.01367
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00060	-0.00058	-0.00039
	OE	0.00000	0.00000	0.00000
	OE	0.00251	0.00221	0.01279

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00272	-0.00272	-0.00273
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00245	-0.00248	-0.00246
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00212	-0.00215	-0.00213
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00192	-0.00194	-0.00193

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00272	0.00272	0.00273
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00252	0.00254	0.00250
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00212	0.00215	0.00213
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00197	0.00198	0.00195

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)	0.00199	0.00153	0.01240
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00184	0.00138	0.01220
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00140	0.00112	0.01198
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00128	0.00101	0.01183

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)	0.00598	0.00591	0.01815
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00599	0.00600	0.01824
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00490	0.00487	0.01629
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00494	0.00498	0.01637

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tnbufi_1	12.45420
sky130_osu_sc_18T_ms__tnbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tnbufi_1	0.00515	0.00788	1.37820
sky130_osu_sc_18T_ms__tnbufi_l	0.00416	0.00617	1.05259

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.03931	0.04717
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.01049	0.01257

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)	0.03995	0.84184	11.00740
	OE->Y (RR)	0.02558	0.33340	4.59626
	OE->Y (FR)	0.05162	0.89498	11.55290
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.04555	0.91483	11.14710
	OE->Y (RR)	0.02681	0.33370	4.59654
	OE->Y (FR)	0.05569	0.94416	11.36340

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)	0.02612	0.56993	7.48049
	OE->Y (RF)	0.02527	0.33338	4.59626
	OE->Y (FF)	0.04965	0.52495	5.26013
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.02960	0.61588	7.66882
	OE->Y (RF)	0.02661	0.33368	4.59652
	OE->Y (FF)	0.05534	0.55905	5.18170

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	0.00526	0.00530	0.00660
	OE	0.00000	0.00000	0.00000
	OE	0.01281	0.01325	0.02624
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00422	0.00424	0.00541
	OE	0.00000	0.00000	0.00000
	OE	0.01000	0.01037	0.02229

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	-0.00100	-0.00101	-0.00086
	OE	0.00000	0.00000	0.00000
	OE	0.01150	0.01217	0.02392
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00078	-0.00075	-0.00057
	OE	0.00000	0.00000	0.00000
	OE	0.00888	0.00927	0.01983

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)	-0.00231	-0.00231	-0.00232
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00207	-0.00209	-0.00208
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00173	-0.00176	-0.00174
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00155	-0.00157	-0.00156

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)	0.00231	0.00231	0.00232
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00213	0.00215	0.00212
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00173	0.00176	0.00174
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00159	0.00160	0.00158

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)	-0.00375	-0.00457	0.00701
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00373	-0.00446	0.00704
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00282	-0.00334	0.00797
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00279	-0.00324	0.00801

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)	0.00973	0.01025	0.02305
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00959	0.01013	0.02290
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00760	0.00806	0.01990
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00750	0.00795	0.01981

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__xnor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xnor2_l	0.01016	0.00919	1.44065

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_l	0.00000	0.07738	0.14135

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	0.09137	0.71834	7.04307
	A->Y (FR)	!B	0.05174	0.86413	11.24990
	B->Y (RR)	A	0.07262	0.69386	6.98541
	B->Y (FR)	!A	0.07181	0.92298	11.80140

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	0.08020	0.60577	5.77375
	A->Y (RF)	!B	0.03984	0.60454	7.84294
	B->Y (FF)	A	0.07307	0.59917	5.77844
	B->Y (RF)	!A	0.04703	0.61440	7.84169

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	0.00504	0.00449	0.01229
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01270	0.01300	0.02618
	B	A	0.00000	0.00000	0.00000
	B	A	0.00201	0.00166	0.01189
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01382	0.01386	0.02619

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	0.01597	0.01574	0.02720
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00365	0.00306	0.01292
	B	A	0.00000	0.00000	0.00000
	B	A	0.01443	0.01469	0.02694
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00489	0.00417	0.01404

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__xor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xor2_l	0.01017	0.00924	1.41654

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.07738	0.12049

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	0.08802	0.69923	6.92093
	A->Y (FR)	B	0.06430	0.91539	11.77770
	B->Y (RR)	!A	0.07563	0.69440	6.93946
	B->Y (FR)	A	0.06970	0.92085	11.75740

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	0.07409	0.59026	5.52814
	A->Y (RF)	B	0.03583	0.58960	7.59577
	B->Y (FF)	!A	0.06750	0.57915	5.52128
	B->Y (RF)	A	0.04405	0.59501	7.56588

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	0.01487	0.01502	0.02769
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00291	0.00156	0.01152
	B	A	0.00000	0.00000	0.00000
	B	A	0.01524	0.01542	0.02793
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00180	0.00136	0.01162

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	0.00324	0.00242	0.01254
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01640	0.01679	0.02801
	B	A	0.00000	0.00000	0.00000
	B	A	0.00327	0.00250	0.01257
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01466	0.01528	0.02721

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56, Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__ant	6.59340
sky130_osu_sc_18T_ms__tiehi	6.59340
sky130_osu_sc_18T_ms__tielo	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_18T_ms__ant	0.73321
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	296996.00000	593992.00000
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
	-0.00159	0.06825	0.91614

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
	5.16740	4.88939	1.14208