sky130_osu_sc_15T_ms_tt_1P68_25C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_MS__ADDFx
SKY130_OSU_SC_15T_MS__ADDHx
SKY130_OSU_SC_15T_MS__AND2x
SKY130_OSU_SC_15T_MS__AOI21
SKY130_OSU_SC_15T_MS__AOI22
SKY130_OSU_SC_15T_MS__BUFx
SKY130_OSU_SC_15T_MS__DFFRx
SKY130_OSU_SC_15T_MS__DFFSRx
SKY130_OSU_SC_15T_MS__DFFSx
SKY130_OSU_SC_15T_MS__DFFx
SKY130_OSU_SC_15T_MS__INVx
SKY130_OSU_SC_15T_MS__MUX2
SKY130_OSU_SC_15T_MS__NAND2x
SKY130_OSU_SC_15T_MS__NOR2x
SKY130_OSU_SC_15T_MS__OAI21
SKY130_OSU_SC_15T_MS__OAI22
SKY130_OSU_SC_15T_MS__OR2x
SKY130_OSU_SC_15T_MS__TBUFIx
SKY130_OSU_SC_15T_MS__TNBUFIx
SKY130_OSU_SC_15T_MS__XNOR2
SKY130_OSU_SC_15T_MS__XOR2
SKY130_OSU_SC_15T_MS_x

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01529	0.01530	0.01178	1.86679	0.85766	1.77727
sky130_osu_sc_15T_ms__addf_l	0.01528	0.01529	0.01180	1.12223	0.85911	1.14969

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.27790	0.36203
sky130_osu_sc_15T_ms__addf_l	0.00000	0.17596	0.26008

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.15449	1.79530	26.50280
	B->CO (RR)	0.13616	1.72560	25.62740
	CI->CO (RR)	0.14610	1.81632	26.96910
	CON->CO (FR)	0.02646	0.74573	11.24780
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.16032	1.65000	20.30820
	B->CO (RR)	0.15487	1.60464	19.85770
	CI->CO (RR)	0.15187	1.67201	20.80350
	CON->CO (FR)	0.03383	0.84703	11.34270

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.21216	2.26664	33.24310
	B->CO (FF)	0.18923	2.17055	31.92050
	CI->CO (FF)	0.18730	2.24421	33.36210
	CON->CO (RF)	0.02413	0.64495	9.71578
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.20518	1.89198	22.98160
	B->CO (FF)	0.18317	1.81764	22.20210
	CI->CO (FF)	0.18026	1.87011	23.13720
	CON->CO (RF)	0.02590	0.63211	8.52000

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (FR)	0.15486	0.98512	10.78650
	B->CON (FR)	0.13506	0.92693	10.48200
	CI->CON (FR)	0.13003	0.96460	10.96640
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.14660	0.97751	10.79000
	B->CON (FR)	0.12732	0.91982	10.48520
	CI->CON (FR)	0.12165	0.95706	10.96990

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (RF)	0.09888	0.68109	7.64514
	B->CON (RF)	0.09532	0.68029	7.79457
	CI->CON (RF)	0.09039	0.70588	8.18416
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.09462	0.67720	7.64818
	B->CON (RF)	0.09133	0.67679	7.79751
	CI->CON (RF)	0.08611	0.70225	8.18721

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-R)	0.30683	2.04262	25.52240
	B->S (-R)	0.31555	2.03239	24.74380
	CI->S (-R)	0.27994	2.01583	25.63810
	CON->S (RR)	0.08445	0.67059	7.38317
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.29557	1.86843	20.39850
	B->S (-R)	0.30440	1.86943	19.96980
	CI->S (-R)	0.26846	1.84215	20.54170
	CON->S (RR)	0.08684	0.74121	7.35952

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-F)	0.25720	1.62770	19.28340
	B->S (-F)	0.25799	1.57618	18.71660
	CI->S (-F)	0.24797	1.64460	19.73720
	CON->S (FF)	0.10452	0.69413	6.88030
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.24055	1.43795	14.94860
	B->S (-F)	0.23494	1.38494	14.70700
	CI->S (-F)	0.23132	1.45648	15.43760
	CON->S (FF)	0.09877	0.68402	6.12481

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00277	0.00312	0.01068
	B	0.00427	0.00439	0.01062
	CI	0.00426	0.00468	0.01225
sky130_osu_sc_15T_ms__addf_l	A	0.00204	0.00218	0.00641
	B	0.00354	0.00347	0.00707
	CI	0.00353	0.00374	0.00803

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01092	0.01138	0.02341
	B	0.01149	0.01191	0.02221
	CI	0.00922	0.00970	0.02210
sky130_osu_sc_15T_ms__addf_l	A	0.01022	0.01049	0.01732
	B	0.01079	0.01108	0.01669
	CI	0.00852	0.00882	0.01618

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01090	0.01112	0.01620
	B	0.01129	0.01148	0.01592
	CI	0.01012	0.01059	0.01521
sky130_osu_sc_15T_ms__addf_l	A	0.01021	0.01040	0.01548
	B	0.01061	0.01076	0.01519
	CI	0.00942	0.00986	0.01450

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00276	0.00295	0.00639
	B	0.00422	0.00422	0.00727
	CI	0.00424	0.00449	0.00810
sky130_osu_sc_15T_ms__addf_l	A	0.00203	0.00215	0.00541
	B	0.00351	0.00342	0.00632
	CI	0.00352	0.00369	0.00710

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01091	0.01137	0.02268
	B	0.01148	0.01190	0.02155
	CI	0.00921	0.00969	0.02138
sky130_osu_sc_15T_ms__addf_l	A	0.01022	0.01049	0.01749
	B	0.01079	0.01109	0.01686
	CI	0.00852	0.00883	0.01641

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02416	0.02434	0.03153
	B	0.02172	0.02187	0.03445
	CI	0.01977	0.01967	0.02680
sky130_osu_sc_15T_ms__addf_l	A	0.02318	0.02310	0.03046
	B	0.02079	0.02065	0.03389
	CI	0.01879	0.01868	0.02608

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00751	0.00831	1.84262	0.91845	1.88648
sky130_osu_sc_15T_ms__addh_l	0.00751	0.00831	1.17754	0.92089	1.18913

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.31497	0.36183
sky130_osu_sc_15T_ms__addh_l	0.00000	0.18749	0.25988

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.10401	0.69599	7.36981
	B->CO (RR)	0.10781	0.69353	7.45254
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.10808	0.76882	7.35450
	B->CO (RR)	0.11193	0.76793	7.41413

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (FF)	0.08768	0.66144	6.89958
	B->CO (FF)	0.09342	0.67519	6.92645
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.08328	0.60936	5.42818
	B->CO (FF)	0.08872	0.62332	5.45525

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (RR)	B	0.14205	0.57630	3.93750
	A->CON (FR)	!B	0.08497	0.89671	10.82470
	B->CON (RR)	A	0.14556	0.57275	4.00878
	B->CON (FR)	!A	0.10409	0.91639	10.75520
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.13084	0.55797	3.91057
	A->CON (FR)	!B	0.07736	0.88966	10.83450
	B->CON (RR)	A	0.13440	0.55653	3.97010
	B->CON (FR)	!A	0.09648	0.90920	10.76510

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (FF)	B	0.13712	0.71227	5.77931
	A->CON (RF)	!B	0.05836	0.67099	8.30754
	B->CON (FF)	A	0.13514	0.74067	6.06596
	B->CON (RF)	!A	0.07062	0.66893	8.05684
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.12746	0.69271	5.70868
	A->CON (RF)	!B	0.05436	0.66796	8.31492
	B->CON (FF)	A	0.12542	0.72148	5.99603
	B->CON (RF)	!A	0.06669	0.66380	8.06418

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (RR)	!B	0.10781	1.74874	26.71730
	A->S (FR)	B	0.18720	1.77182	23.96890
	B->S (RR)	!A	0.12028	1.70917	25.78240
	B->S (FR)	A	0.18558	1.83653	24.93320
	CON->S (FR)	-	0.02877	0.76452	11.57170
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.10983	1.61335	21.08410
	A->S (FR)	B	0.18368	1.62396	18.29550
	B->S (RR)	!A	0.12247	1.58518	20.45120
	B->S (FR)	A	0.18186	1.67830	18.96290
	CON->S (FR)	-	0.03409	0.85454	11.60710

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (FF)	!B	0.13265	2.06283	31.50190
	A->S (RF)	B	0.18150	1.40426	18.06520
	B->S (FF)	!A	0.15177	2.08678	31.50100
	B->S (RF)	A	0.18502	1.39999	18.14500
	CON->S (RF)	-	0.02280	0.63371	9.58314
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.12555	1.75751	22.86950
	A->S (RF)	B	0.17077	1.22142	12.87390
	B->S (FF)	!A	0.14463	1.78077	22.82770
	B->S (RF)	A	0.17434	1.21891	12.93970
	CON->S (RF)	-	0.02451	0.63538	8.68258

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00517	0.00497	0.00814
	B	0.00000	0.00000	0.00000
	B	0.00467	0.00443	0.00782
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00448	0.00425	0.00840
	B	0.00000	0.00000	0.00000
	B	0.00398	0.00370	0.00776

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00790	0.00775	0.01344
	B	0.00000	0.00000	0.00000
	B	0.00819	0.00848	0.01436
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00723	0.00705	0.01250
	B	0.00000	0.00000	0.00000
	B	0.00753	0.00773	0.01319

Internal switching power(pJ) to CON rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00516	0.00497	0.00885
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00697	0.00709	0.00873
	B	A	0.00000	0.00000	0.00000
	B	A	0.00467	0.00444	0.00838
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00777	0.00777	0.00863
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00447	0.00424	0.00826
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00651	0.00658	0.00807
	B	A	0.00000	0.00000	0.00000
	B	A	0.00398	0.00370	0.00814
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00731	0.00726	0.00796

Internal switching power(pJ) to CON falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00790	0.00776	0.01312
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00107	0.00112	0.00206
	B	A	0.00000	0.00000	0.00000
	B	A	0.00819	0.00846	0.01407
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00191	0.00185	0.00261
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00723	0.00705	0.01242
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00044	0.00045	0.00110
	B	A	0.00000	0.00000	0.00000
	B	A	0.00753	0.00773	0.01314
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00128	0.00118	0.00172

Internal switching power(pJ) to S rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00791	0.00777	0.01358
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00109	0.00120	0.00261
	B	A	0.00000	0.00000	0.00000
	B	A	0.00820	0.00851	0.01453
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00194	0.00193	0.00314
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00724	0.00707	0.01249
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00045	0.00048	0.00113
	B	A	0.00000	0.00000	0.00000
	B	A	0.00754	0.00774	0.01316
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00130	0.00121	0.00182

Internal switching power(pJ) to S falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00517	0.00497	0.00810
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00697	0.00713	0.00881
	B	A	0.00000	0.00000	0.00000
	B	A	0.00467	0.00443	0.00778
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00779	0.00783	0.00903
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00448	0.00424	0.00861
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00651	0.00658	0.00803
	B	A	0.00000	0.00000	0.00000
	B	A	0.00398	0.00371	0.00807
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00732	0.00727	0.00804

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00403	0.00414	1.83789
sky130_osu_sc_15T_ms__and2_2	0.00404	0.00414	3.58152
sky130_osu_sc_15T_ms__and2_4	0.00404	0.00414	6.86651
sky130_osu_sc_15T_ms__and2_6	0.00407	0.00414	10.11681
sky130_osu_sc_15T_ms__and2_8	0.00404	0.00415	13.10133
sky130_osu_sc_15T_ms__and2_l	0.00306	0.00317	1.12451

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.15074	0.24111
sky130_osu_sc_15T_ms__and2_2	0.00000	0.24112	0.24132
sky130_osu_sc_15T_ms__and2_4	0.00000	0.42190	0.48201
sky130_osu_sc_15T_ms__and2_6	0.00000	0.60268	0.72290
sky130_osu_sc_15T_ms__and2_8	0.00000	0.78346	0.96380
sky130_osu_sc_15T_ms__and2_l	0.00000	0.02326	0.03713

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.07903	0.62602	7.14005
	B->Y (RR)	0.08427	0.63156	7.10224
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.09139	0.57974	7.21327
	B->Y (RR)	0.09662	0.57841	7.18411
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.12629	0.60033	7.50834
	B->Y (RR)	0.13149	0.58984	7.48556
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.16029	0.64130	7.76610
	B->Y (RR)	0.16546	0.62514	7.74359
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.19351	0.68163	7.97758
	B->Y (RR)	0.19872	0.66479	7.93840
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.08911	0.71660	7.01037
	B->Y (RR)	0.09460	0.72039	6.97786

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (FF)	0.06780	0.58693	6.43831
	B->Y (FF)	0.07156	0.60438	6.47650
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.07774	0.55849	6.49724
	B->Y (FF)	0.08188	0.57046	6.55309
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.10794	0.58381	6.73736
	B->Y (FF)	0.11165	0.59211	6.78935
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.14030	0.62492	6.95873
	B->Y (FF)	0.14352	0.63126	7.01066
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.17033	0.66221	7.05069
	B->Y (FF)	0.17324	0.66694	7.09951
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.07725	0.62842	5.84772
	B->Y (FF)	0.08290	0.64706	5.90706

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00379	0.00364	0.02011
	B	0.00000	0.00000	0.00000
	B	0.00387	0.00341	0.01340
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00746	0.00756	0.02280
	B	0.00000	0.00000	0.00000
	B	0.00754	0.00741	0.01694
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01563	0.01617	0.02981
	B	0.00000	0.00000	0.00000
	B	0.01576	0.01606	0.02444
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02408	0.02488	0.03931
	B	0.00000	0.00000	0.00000
	B	0.02430	0.02482	0.03462
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03280	0.03328	0.04650
	B	0.00000	0.00000	0.00000
	B	0.03283	0.03320	0.04321
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00274	0.00264	0.01356
	B	0.00000	0.00000	0.00000
	B	0.00282	0.00246	0.00921

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00963	0.01024	0.02649
	B	0.00000	0.00000	0.00000
	B	0.01088	0.01131	0.02640
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01213	0.01320	0.02914
	B	0.00000	0.00000	0.00000
	B	0.01341	0.01435	0.02915
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01841	0.02038	0.03609
	B	0.00000	0.00000	0.00000
	B	0.01973	0.02126	0.03586
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02483	0.02767	0.04315
	B	0.00000	0.00000	0.00000
	B	0.02611	0.02856	0.04282
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03148	0.03479	0.05042
	B	0.00000	0.00000	0.00000
	B	0.03283	0.03526	0.04955
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00732	0.00765	0.01799
	B	0.00000	0.00000	0.00000
	B	0.00821	0.00848	0.01802

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00352	-0.00354	-0.00355
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00352	-0.00353	-0.00355
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00352	-0.00353	-0.00355
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00354	-0.00355	-0.00357
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00352	-0.00353	-0.00354
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00249	-0.00249	-0.00250

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00354	0.00362	0.00356
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00355	0.00363	0.00356
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00355	0.00363	0.00357
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00357	0.00365	0.00359
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00355	0.00363	0.00357
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00251	0.00256	0.00251

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00334	-0.00336	-0.00335
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00334	-0.00336	-0.00335
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00334	-0.00336	-0.00334
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00334	-0.00334	-0.00334
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00334	-0.00336	-0.00334
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00236	-0.00238	-0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00336	0.00341	0.00336
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00337	0.00341	0.00336
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00337	0.00342	0.00336
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00337	0.00342	0.00336
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00337	0.00342	0.00337
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00239	0.00241	0.00238

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00381	0.00398	0.00385	0.82694

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.05841	0.12045

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.08331	0.91884	10.68490
	A1->Y (FR)	0.06964	0.87052	10.30210
	B0->Y (FR)	0.06113	0.90109	10.87000

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (RF)	0.05319	0.60881	7.20175
	A1->Y (RF)	0.04836	0.62535	7.60388
	B0->Y (RF)	0.03081	0.57969	7.26989

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00844	0.00836	0.00931
	A1	0.00000	0.00000	0.00000
	A1	0.00708	0.00697	0.00792
	B0	0.00517	0.00528	0.00816

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00181	0.00150	0.00223
	A1	0.00000	0.00000	0.00000
	A1	0.00185	0.00159	0.00264
	B0	-0.00085	-0.00083	0.00030

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00263	-0.00306	-0.00305
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00309	-0.00311	-0.00310
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00309	-0.00311	-0.00310

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00304	0.00307	0.00305
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00309	0.00314	0.00311
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00312	0.00314	0.00311

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00260	-0.00302	-0.00301
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00304	-0.00306	-0.00305
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00331	-0.00333	-0.00333

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00298	0.00302	0.00301
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00304	0.00306	0.00306
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00333	0.00334	0.00334

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00150	-0.00153	-0.00150

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00164	0.00164	0.00154

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_ms__aoi22_l	0.00380	0.00395	0.00409	0.00389	0.85546

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.06496	0.24089

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.10210	0.93961	10.78270
	A1->Y (FR)	0.09085	0.91869	10.67600
	B0->Y (FR)	0.06218	0.89089	10.82910
	B1->Y (FR)	0.07359	0.91560	10.98390

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (RF)	0.06994	0.63387	7.35992
	A1->Y (RF)	0.06503	0.64850	7.76225
	B0->Y (RF)	0.03588	0.61684	7.73348
	B1->Y (RF)	0.04080	0.59986	7.33164

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.01023	0.01013	0.01096
	A1	0.00888	0.00874	0.00957
	B0	0.00564	0.00572	0.00864
	B1	0.00843	0.00844	0.01115

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00373	0.00342	0.00411
	A1	0.00377	0.00348	0.00451
	B0	-0.00058	-0.00060	0.00049
	B1	-0.00050	-0.00063	0.00014

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00267	-0.00305	-0.00306
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00309	-0.00309	-0.00310
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00309	-0.00312	-0.00310
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00309	-0.00312	-0.00310

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00304	0.00307	0.00306
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00309	0.00311	0.00311
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00312	0.00314	0.00311
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00312	0.00314	0.00311

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00263	-0.00301	-0.00300
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00304	-0.00306	-0.00304
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00330	-0.00332	-0.00332
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00330	-0.00332	-0.00332

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00298	0.00301	0.00300
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00304	0.00306	0.00306
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00332	0.00333	0.00333
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00332	0.00333	0.00333

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00150	-0.00154	-0.00151
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00150	-0.00152	-0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00342	-0.00342	-0.00345
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00342	-0.00343	-0.00345

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00171	0.00171	0.00156
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00151	0.00152	0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00344	0.00346	0.00346
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00344	0.00347	0.00346

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00152	-0.00155	-0.00152
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00151	-0.00152	-0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00316	-0.00317	-0.00316
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00316	-0.00317	-0.00316

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00172	0.00174	0.00157
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00151	0.00152	0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00318	0.00322	0.00317
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00318	0.00322	0.00317

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__buf_1	7.93650
sky130_osu_sc_15T_ms__buf_2	10.37850
sky130_osu_sc_15T_ms__buf_4	15.26250
sky130_osu_sc_15T_ms__buf_6	20.14650
sky130_osu_sc_15T_ms__buf_8	25.03050
sky130_osu_sc_15T_ms__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00413	1.80254
sky130_osu_sc_15T_ms__buf_2	0.00417	3.59827
sky130_osu_sc_15T_ms__buf_4	0.00417	6.91799
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00418	13.35602
sky130_osu_sc_15T_ms__buf_l	0.00319	1.12697

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.12066	0.12066
sky130_osu_sc_15T_ms__buf_2	0.00000	0.18099	0.24111
sky130_osu_sc_15T_ms__buf_4	0.00000	0.30165	0.48200
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.54297	0.96379
sky130_osu_sc_15T_ms__buf_l	0.00000	0.01872	0.01872

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (RR)**	0.05947	0.59432	6.94668
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.06822	0.54012	7.11095
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.09262	0.54343	7.35403
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.13934	0.60371	7.80287
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.06817	0.67809	6.83188

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (FF)**	0.06426	0.57413	6.32129
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.07581	0.56584	6.79499
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.10631	0.59301	7.12791
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.16886	0.67204	7.55478
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.07438	0.62010	5.84015

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00359	0.00380	0.01562
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00720	0.00713	0.01871
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01530	0.01570	0.02684
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03193	0.03320	0.04529
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00269	0.00251	0.01122

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00929	0.00982	0.02579
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01187	0.01287	0.02777
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01816	0.01983	0.03467
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03130	0.03405	0.04870
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00713	0.00749	0.01766

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00063	-0.00063	-0.00062

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00063	0.00063	0.00062

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00391	0.00389	0.01158	1.67832	1.67917
sky130_osu_sc_15T_ms__dffr_l	0.00391	0.00389	0.01157	1.12470	1.12510

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.34480	0.59249
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.24285	0.49055

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	0.33174	1.45818	15.87330
	QN->Q (FR)	0.03332	0.86605	12.79600
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.32276	1.55686	15.15990
	QN->Q (FR)	0.03753	0.92956	12.45820

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RF)	0.31115	1.49133	16.83220
	QN->Q (RF)	0.02711	0.69688	10.25370
	RN->Q (FF)	0.22615	1.48058	17.61660
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.31759	1.62754	16.24770
	QN->Q (RF)	0.02771	0.68833	9.28370
	RN->Q (FF)	0.23307	1.61634	17.01750

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->QN (RR)	0.27353	0.84348	7.14065
	RN->QN (FR)	0.18843	0.83263	7.91765
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.27619	0.92276	7.23523
	RN->QN (FR)	0.19137	0.91161	8.00293

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	**CK->QN (RF)**	0.28479	0.77254	5.64751
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.26889	0.76583	5.07870

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.07495	-0.09259	-0.22654
	setup	CK (R)	0.26400	0.29446	0.97086
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07157	-0.09369	-0.22839
	setup	CK (R)	0.26350	0.29611	0.98351

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.12083	-0.35339	-2.86569
	setup	CK (R)	0.14684	0.36644	2.92203
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.11935	-0.35520	-2.86276
	setup	CK (R)	0.14684	0.36644	2.92191

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.07495	-0.09259	-0.22654
	setup	CK (R)	0.26400	0.29446	0.97086
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.07157	-0.09369	-0.22839
	setup	CK (R)	0.26350	0.29611	0.98351

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.12083	-0.35339	-2.86569
	setup	CK (R)	0.14684	0.36644	2.92203
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.11935	-0.35520	-2.86276
	setup	CK (R)	0.14684	0.36644	2.92191

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.22358	0.25225	1.09790
	removal	CK (R)	-0.05063	-0.05987	-0.15459
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.22381	0.25517	1.11175
	removal	CK (R)	-0.04905	-0.05996	-0.15325

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.22358	0.25225	1.09790
	removal	CK (R)	-0.05063	-0.05987	-0.15459
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.22381	0.25517	1.11175
	removal	CK (R)	-0.04905	-0.05996	-0.15325

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	RN ()	0.13065	0.48218	13.33370
	min_pulse_width	RN ()	0.13065	0.48218	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.13065	0.48218	13.33370
	min_pulse_width	RN ()	0.13065	0.48218	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.15602	0.48218	13.33370
	min_pulse_width	CK ()	0.16327	0.48218	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.14515	0.48218	13.33370
	min_pulse_width	CK ()	0.15965	0.48218	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_15T_ms__dffr_1	min_pulse_width	CK ()	0.32635	0.48218	13.33370
	min_pulse_width	CK ()	0.11978	0.48218	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.32635	0.48218	13.33370
	min_pulse_width	CK ()	0.11978	0.48218	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00947	0.00736	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00834	0.00683	0.00585

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01064	0.00844	0.00000
	RN	-0.00124	-0.07602	-1.18422
	RN	0.02458	0.02259	0.00239
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00951	0.00819	0.00319
	RN	-0.00124	-0.05979	-0.79358
	RN	0.02343	0.02232	0.01806

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01064	0.00842	0.00000
	RN	-0.00124	-0.07604	-1.18479
	RN	0.02458	0.02260	0.00241
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00951	0.00819	0.00326
	RN	-0.00124	-0.05980	-0.79387
	RN	0.02343	0.02231	0.01804

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00942	0.00731	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00829	0.00678	0.00535

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00253	-0.00300	-0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01156	0.01093	0.01884
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00489	0.00434	0.01245
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00253	-0.00300	-0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01156	0.01093	0.01884
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00489	0.00434	0.01244

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00302	0.00304	0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01865	0.01830	0.02707
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00897	0.00870	0.01732
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00302	0.00304	0.00304
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01865	0.01830	0.02707
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00897	0.00870	0.01732

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00344	0.00305	0.01953
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01036	0.00969	0.02607
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00344	0.00305	0.01953
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01035	0.00968	0.02606

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00899	0.00930	0.02720
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01858	0.01863	0.03624
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00898	0.00929	0.02719
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01857	0.01862	0.03624

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00120	0.01494
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00560	0.00441	0.02116
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00107	-0.00153	0.01450
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00120	0.01494
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00560	0.00441	0.02116
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00107	-0.00153	0.01450

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01381	0.01407	0.03205
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02926	0.02862	0.04806
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02211	0.02197	0.03952
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02867	0.02897	0.06079
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01541	0.01560	0.03308
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01380	0.01408	0.03205
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02926	0.02862	0.04806
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02211	0.02196	0.03952
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02867	0.02897	0.06079
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01541	0.01560	0.03308

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_15T_ms__dffsr_1	0.00387	0.00390	0.00862	0.01180	1.87498	1.87124
sky130_osu_sc_15T_ms__dffsr_l	0.00387	0.00390	0.00861	0.01180	1.12212	1.12206

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.42680	0.59231
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.32486	0.49037

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.32144	1.48229	17.05390
	QN->Q (FR)	0.02913	0.80676	12.24210
	RN->Q (RR)	0.25988	1.43608	17.07070
	SN->Q (FR)	0.23424	1.49375	18.15050
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.32251	1.55977	15.14070
	QN->Q (FR)	0.03755	0.92692	12.41840
	RN->Q (RR)	0.26077	1.51248	15.16640
	SN->Q (FR)	0.23564	1.56841	16.21730

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RF)	0.36004	1.56078	17.84780
	QN->Q (RF)	0.02679	0.72437	10.96630
	RN->Q (FF)	0.23505	1.51391	18.61610
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.37234	1.68605	16.27580
	QN->Q (RF)	0.02766	0.68716	9.26391
	RN->Q (FF)	0.24743	1.63885	17.04230

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RR)	0.32230	0.88857	7.31294
	RN->QN (FR)	0.19810	0.84222	8.08557
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.32996	0.98173	7.28480
	RN->QN (FR)	0.20556	0.93535	8.05024

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RF)	0.27902	0.79314	6.26015
	RN->QN (RF)	0.21782	0.74717	6.28182
	SN->QN (FF)	0.19223	0.80488	7.35739
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.27082	0.77176	5.09091
	RN->QN (RF)	0.21011	0.72682	5.10765
	SN->QN (FF)	0.18444	0.78071	6.16581

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.07330	-0.09859	-0.27974
	setup	CK (R)	0.24434	0.27560	1.02012
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07326	-0.09998	-0.27715
	setup	CK (R)	0.24405	0.27522	1.02720

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.13929	-0.37520	-2.99185
	setup	CK (R)	0.17831	0.38938	3.03894
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.14090	-0.37507	-2.99041
	setup	CK (R)	0.17676	0.38938	3.03894

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.07330	-0.09859	-0.27974
	setup	CK (R)	0.24434	0.27560	1.02012
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07326	-0.09998	-0.27715
	setup	CK (R)	0.24405	0.27522	1.02720

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.13929	-0.37520	-2.99185
	setup	CK (R)	0.17831	0.38938	3.03894
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.14090	-0.37507	-2.99041
	setup	CK (R)	0.17676	0.38938	3.03894

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.18837	0.21602	1.04156
	removal	CK (R)	-0.02306	-0.03127	-0.09277
	hold	SN (R)	-0.18721	-0.37248	-1.69529
	setup	SN (R)	0.21278	0.42656	4.54703
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.18623	0.21362	1.04273
	removal	CK (R)	-0.02306	-0.03127	-0.09277
	hold	SN (R)	-0.18208	-0.36153	-1.62885
	setup	SN (R)	0.21235	0.41232	4.42956

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.18837	0.21602	1.04156
	removal	CK (R)	-0.02306	-0.03127	-0.09277
	hold	SN (R)	-0.18943	-0.37248	-1.69529
	hold	SN (R)	-0.18721	-0.37248	-1.70014
	setup	SN (R)	0.21278	0.42440	4.31446
	setup	SN (R)	0.21023	0.42656	4.54703
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.18623	0.21362	1.04273
	removal	CK (R)	-0.02306	-0.03127	-0.09277
	hold	SN (R)	-0.18285	-0.36153	-1.62885
	hold	SN (R)	-0.18208	-0.36213	-1.64115
	setup	SN (R)	0.21235	0.41197	4.19752
	setup	SN (R)	0.20255	0.41232	4.42956

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	RN ()	0.15240	0.48218	13.33370
	min_pulse_width	RN ()	0.15602	0.48218	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.15240	0.48218	13.33370
	min_pulse_width	RN ()	0.14877	0.48218	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.04511	0.08584	3.93917
	removal	CK (R)	-0.02017	-0.06445	-0.34815
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04709	0.08573	3.77191
	removal	CK (R)	-0.02017	-0.06445	-0.34815

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.04511	0.08584	3.93917
	removal	CK (R)	-0.02017	-0.06445	-0.34815
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04709	0.08573	3.77191
	removal	CK (R)	-0.02017	-0.06445	-0.34815

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	SN ()	0.18501	0.48218	13.33370
	min_pulse_width	SN ()	0.18501	0.48218	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.18501	0.48218	13.33370
	min_pulse_width	SN ()	0.17777	0.48218	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.14515	0.48218	13.33370
	min_pulse_width	CK ()	0.18501	0.48218	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.14153	0.48218	13.33370
	min_pulse_width	CK ()	0.18139	0.48218	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_15T_ms__dffsr_1	min_pulse_width	CK ()	0.30823	0.48218	13.33370
	min_pulse_width	CK ()	0.15602	0.48218	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.30823	0.48218	13.33370
	min_pulse_width	CK ()	0.15602	0.48218	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01183	0.00953	-0.00021
	RN	0.02163	0.01954	-0.00439
	SN	-0.00124	-0.08124	-1.32299
	SN	0.02396	0.02160	-0.00406
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01082	0.00931	0.00831
	RN	0.02061	0.01933	0.01348
	SN	-0.00124	-0.05970	-0.79177
	SN	0.02293	0.02139	0.01380

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01244	0.01107	0.00021
	RN	-0.00124	-0.08124	-1.32298
	RN	0.02564	0.02434	0.01423
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01137	0.01013	0.00532
	RN	-0.00124	-0.05970	-0.79177
	RN	0.02454	0.02335	0.01949

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01242	0.01108	0.00009
	RN	-0.00124	-0.08114	-1.32024
	RN	0.02562	0.02431	0.01417
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01137	0.01012	0.00537
	RN	-0.00124	-0.05970	-0.79173
	RN	0.02454	0.02334	0.01942

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01178	0.00950	-0.00009
	RN	0.02159	0.01951	-0.00443
	SN	-0.00124	-0.08114	-1.32028
	SN	0.02392	0.02159	-0.00333
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01077	0.00927	0.00780
	RN	0.02056	0.01927	0.01319
	SN	-0.00124	-0.05970	-0.79169
	SN	0.02288	0.02136	0.01406

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00297	-0.00303	-0.00303
	(!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)	0.01489	0.01429	0.02210
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00557	0.00505	0.01300
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00557	0.00507	0.01301
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00562	0.00510	0.01305
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00297	-0.00303	-0.00303
	(!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)	0.01489	0.01429	0.02211
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00557	0.00505	0.01300
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00557	0.00506	0.01301
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00562	0.00510	0.01305

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00304	0.00305	0.00303
	(!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)	0.02153	0.02115	0.02943
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00956	0.00935	0.01783
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00965	0.00940	0.01784
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00951	0.00930	0.01777
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00304	0.00305	0.00303
	(!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)	0.02152	0.02114	0.02942
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00955	0.00934	0.01782
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00964	0.00939	0.01783
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00950	0.00929	0.01776

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00311	0.00276	0.01888
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01269	0.01201	0.02850
sky130_osu_sc_15T_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)	0.00311	0.00276	0.01889
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01269	0.01202	0.02850

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00968	0.01011	0.02806
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01967	0.01965	0.03771
sky130_osu_sc_15T_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)	0.00967	0.01006	0.02805
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01966	0.01963	0.03770

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00699	-0.00703	-0.00704
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00670	-0.00737	-0.00743
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00669	-0.00706	-0.00706
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00458	0.00406	0.01305
sky130_osu_sc_15T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00699	-0.00703	-0.00704
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00668	-0.00735	-0.00742
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00668	-0.00706	-0.00705
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00459	0.00407	0.01306

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00703	0.00706	0.00707
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00740	0.00749	0.00745
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00704	0.00710	0.00708
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01536	0.01496	0.02299
sky130_osu_sc_15T_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)	0.00703	0.00706	0.00707
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00738	0.00747	0.00743
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00703	0.00710	0.00708
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01535	0.01490	0.02298

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00119	0.01493
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00645	0.00537	0.02201
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00631	0.00520	0.02196
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00088	-0.00135	0.01468
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00397	0.00303	0.03421
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00119	0.01493
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00644	0.00535	0.02199
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00630	0.00519	0.02194
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00089	-0.00135	0.01467
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00397	0.00303	0.03422

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03280	0.03225	0.05158
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01386	0.01410	0.03210
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02260	0.02253	0.04003
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02265	0.02254	0.04002
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03150	0.03157	0.06331
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01527	0.01546	0.03294
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01847	0.01890	0.05282
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03280	0.03228	0.05158
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01385	0.01410	0.03210
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02260	0.02253	0.04003
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02265	0.02254	0.04002
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03149	0.03156	0.06328
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01527	0.01546	0.03294
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01846	0.01889	0.05281

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00390	0.00683	0.01157	1.68698	1.68339
sky130_osu_sc_15T_ms__dffs_l	0.00390	0.00683	0.01157	1.12333	1.12806

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.30523	0.47141
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.20329	0.36947

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.25346	1.36854	15.81420
	QN->Q (FR)	0.03331	0.86455	12.77000
	SN->Q (FR)	0.19746	1.45316	17.04710
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.25164	1.47174	15.02960
	QN->Q (FR)	0.03750	0.92544	12.40300
	SN->Q (FR)	0.19598	1.55113	16.21720

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RF)	0.34645	1.53270	16.91770
	QN->Q (RF)	0.02696	0.69501	10.24690
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.35132	1.66329	16.23210
	QN->Q (RF)	0.02760	0.68569	9.25241

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RR)	0.30721	0.88335	7.17215
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.30861	0.95984	7.27121

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RF)	0.21095	0.68296	5.55205
	SN->QN (FF)	0.15449	0.76878	6.78357
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.20236	0.68541	4.99374
	SN->QN (FF)	0.14527	0.76308	6.18862

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.05598	-0.08036	-0.20584
	setup	CK (R)	0.18664	0.22577	0.96847
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05974	-0.08058	-0.20562
	setup	CK (R)	0.18852	0.22596	0.97944

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.12382	-0.35531	-2.88200
	setup	CK (R)	0.16373	0.37073	2.94509
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12215	-0.35738	-2.87891
	setup	CK (R)	0.16373	0.37073	2.94509

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.05598	-0.08036	-0.20584
	setup	CK (R)	0.18664	0.22577	0.96847
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05974	-0.08058	-0.20562
	setup	CK (R)	0.18852	0.22596	0.97944

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.12382	-0.35531	-2.88200
	setup	CK (R)	0.16373	0.37073	2.94509
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.12215	-0.35738	-2.87891
	setup	CK (R)	0.16373	0.37073	2.94509

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04598	0.07776	2.79678
	removal	CK (R)	-0.02119	-0.05236	-0.17365
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04536	0.07750	2.67366
	removal	CK (R)	-0.02119	-0.05236	-0.17365

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04598	0.07776	2.79678
	removal	CK (R)	-0.02119	-0.05236	-0.17365
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04536	0.07750	2.67366
	removal	CK (R)	-0.02119	-0.05236	-0.17365

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	SN ()	0.13790	0.48218	13.33370
	min_pulse_width	SN ()	0.14153	0.48218	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.13790	0.48218	13.33370
	min_pulse_width	SN ()	0.13428	0.48218	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.11253	0.48218	13.33370
	min_pulse_width	CK ()	0.17414	0.48218	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.10529	0.48218	13.33370
	min_pulse_width	CK ()	0.17052	0.48218	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_15T_ms__dffs_1	min_pulse_width	CK ()	0.25024	0.48218	13.33370
	min_pulse_width	CK ()	0.14153	0.48218	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.25024	0.48218	13.33370
	min_pulse_width	CK ()	0.14153	0.48218	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00947	0.00736	0.00000
	SN	-0.00124	-0.07625	-1.19033
	SN	0.02027	0.01830	0.00044
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00833	0.00682	0.00624
	SN	-0.00124	-0.05974	-0.79262
	SN	0.01913	0.01779	0.01119

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01057	0.00845	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00944	0.00816	0.00362

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01056	0.00846	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00944	0.00816	0.00359

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00943	0.00733	0.00000
	SN	-0.00124	-0.07615	-1.18773
	SN	0.02023	0.01826	-0.00018
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00829	0.00680	0.00562
	SN	-0.00124	-0.05989	-0.79592
	SN	0.01908	0.01773	0.01276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00302	-0.00305	-0.00307
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01116	0.01050	0.01861
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00478	0.00424	0.01232
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00303	-0.00305	-0.00307
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01115	0.01050	0.01861
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00478	0.00424	0.01232

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00308	0.00305	0.00307
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01830	0.01790	0.02647
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00911	0.00889	0.01753
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00308	0.00305	0.00307
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01830	0.01790	0.02647
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00910	0.00889	0.01753

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00503	-0.00507	-0.00506
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00381	0.00340	0.01273
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00503	-0.00507	-0.00506
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00381	0.00340	0.01273

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00509	0.00513	0.00508
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01067	0.01044	0.02065
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00509	0.00513	0.00508
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01067	0.01044	0.02065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00122	0.01493
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00102	-0.00149	0.01456
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00313	0.00221	0.03391
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00122	0.01493
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00102	-0.00149	0.01456
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00313	0.00222	0.03391

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02902	0.02846	0.04815
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01382	0.01409	0.03208
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02821	0.02827	0.06012
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01535	0.01553	0.03304
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01793	0.01838	0.05266
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02902	0.02844	0.04815
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01382	0.01409	0.03208
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02820	0.02827	0.06012
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01534	0.01553	0.03303
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01793	0.01841	0.05266

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00406	0.01146	1.88450	1.88476
sky130_osu_sc_15T_ms__dff_l	0.00406	0.01145	1.03216	1.02153

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.38723	0.48271
sky130_osu_sc_15T_ms__dff_l	0.00000	0.28529	0.38077

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.20869	1.35192	16.93450
	QN->Q (FR)	0.02894	0.80513	12.23850
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.21730	1.42154	14.30420
	QN->Q (FR)	0.04217	0.99004	12.97920

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RF)	0.29626	1.49096	17.81420
	QN->Q (RF)	0.02668	0.72353	10.97330
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.31373	1.61975	15.67940
	QN->Q (RF)	0.02771	0.66757	8.85148

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.26005	0.81912	7.26247
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.27164	0.92910	7.12130

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RF)	0.17092	0.66323	6.11842
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.16811	0.62916	4.50593

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.05240	-0.07330	-0.20967
	setup	CK (R)	0.14089	0.18473	0.99606
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.05006	-0.07624	-0.21267
	setup	CK (R)	0.14045	0.18288	0.99813

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.11467	-0.35905	-2.90716
	setup	CK (R)	0.14051	0.37155	2.97960
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.11680	-0.35911	-2.91076
	setup	CK (R)	0.14051	0.37155	2.97983

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.09441	0.48218	13.33370
	min_pulse_width	CK ()	0.16327	0.48218	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.09079	0.48218	13.33370
	min_pulse_width	CK ()	0.15602	0.48218	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_15T_ms__dff_1	**min_pulse_width**	**CK ()**	0.20313	0.48218	13.33370
	min_pulse_width	**CK ()**	0.11253	0.48218	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.20313	0.48218	13.33370
	min_pulse_width	**CK ()**	0.11253	0.48218	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01002	0.00768	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00902	0.00751	0.00789

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01077	0.00943	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00969	0.00793	-0.00188

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01076	0.00940	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00969	0.00797	-0.00168

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00999	0.00760	0.00000
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00898	0.00750	0.00762

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00253	-0.00299	-0.00303
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01047	0.00993	0.01812
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00253	-0.00299	-0.00303
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01047	0.00989	0.01813

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00301	0.00303	0.00303
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01893	0.01860	0.02720
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00301	0.00303	0.00303
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01893	0.01860	0.02721

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00123	0.01496
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00101	-0.00146	0.01461
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00123	0.01496
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00101	-0.00148	0.01461

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01374	0.01402	0.03201
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02834	0.02786	0.04776
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02865	0.02875	0.06092
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01526	0.01546	0.03296
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01374	0.01398	0.03201
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02834	0.02787	0.04776
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02865	0.02876	0.06092
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01526	0.01546	0.03296

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__inv_1	5.49450
sky130_osu_sc_15T_ms__inv_10	27.47250
sky130_osu_sc_15T_ms__inv_2	7.93650
sky130_osu_sc_15T_ms__inv_3	10.37850
sky130_osu_sc_15T_ms__inv_4	12.82050
sky130_osu_sc_15T_ms__inv_6	17.70450
sky130_osu_sc_15T_ms__inv_8	22.58850
sky130_osu_sc_15T_ms__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00395	1.75556
sky130_osu_sc_15T_ms__inv_10	0.03640	15.89964
sky130_osu_sc_15T_ms__inv_2	0.00747	3.47221
sky130_osu_sc_15T_ms__inv_3	0.01112	4.98598
sky130_osu_sc_15T_ms__inv_4	0.01468	6.69531
sky130_osu_sc_15T_ms__inv_6	0.02199	9.88363
sky130_osu_sc_15T_ms__inv_8	0.02920	13.18380
sky130_osu_sc_15T_ms__inv_l	0.00295	0.99212

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.06033	0.12045
sky130_osu_sc_15T_ms__inv_10	0.00000	0.60330	1.20448
sky130_osu_sc_15T_ms__inv_2	0.00000	0.12066	0.24089
sky130_osu_sc_15T_ms__inv_3	0.00000	0.18099	0.36134
sky130_osu_sc_15T_ms__inv_4	0.00000	0.24132	0.48179
sky130_osu_sc_15T_ms__inv_6	0.00000	0.36198	0.72269
sky130_osu_sc_15T_ms__inv_8	0.00000	0.48264	0.96358
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00936	0.01841

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.02769	0.74008	11.06050
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03901	0.50396	10.95920
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02235	0.63997	10.98890
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02462	0.60020	10.99130
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02512	0.56919	10.95840
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02849	0.53707	10.96440
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03339	0.51820	11.04580
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.03662	0.85055	11.05000

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (RF)**	0.02384	0.63127	9.39529
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03473	0.41701	9.31056
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01955	0.54641	9.37883
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.02141	0.51561	9.45193
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.02133	0.48552	9.42391
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02587	0.45207	9.42966
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.03025	0.43468	9.48299
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02543	0.60632	7.97594

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00485	0.00444	0.00705
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04110	0.04736	0.06578
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00855	0.00917	0.01307
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01313	0.01422	0.02002
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01683	0.01900	0.02614
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02495	0.02759	0.03924
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03302	0.03683	0.05203
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00362	0.00369	0.00516

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00101	-0.00097	-0.00019
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01676	-0.01515	-0.00525
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00320	-0.00288	-0.00129
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00427	-0.00396	-0.00129
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00654	-0.00572	-0.00238
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00998	-0.00894	-0.00343
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01350	-0.01223	-0.00441
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00062	-0.00062	0.00015

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_15T_ms__mux2_1	0.37049	0.37058	0.00806	0.37603

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.12091	0.12119

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.01556	0.31570	3.40634
	A1->Y (RR)	-	0.01716	0.31846	3.40976
	S0->Y (RR)	(!A0 * A1)	0.05121	0.31889	1.63051
	S0->Y (FR)	(A0 * !A1)	0.03539	0.41011	3.54342

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (FF)	-	0.01575	0.30672	3.23797
	A1->Y (FF)	-	0.01462	0.30465	3.23097
	S0->Y (FF)	(!A0 * A1)	0.06285	0.37502	2.25944
	S0->Y (RF)	(A0 * !A1)	0.02709	0.34900	2.93040

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00492	-0.00493	-0.00494
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00333	-0.00334	-0.00334
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00602	0.00650	0.02548
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00334	-0.00363	0.01386

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00492	0.00493	0.00494
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00334	0.00334	0.00334
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00089	0.00070	0.01865
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01308	0.01342	0.03187

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00121	-0.00120	-0.00120

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00121	0.00120	0.00121

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00143	-0.00143	-0.00143

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00143	0.00143	0.00143

Passive power(pJ) for S0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00125	-0.00140	0.01624
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00121	-0.00137	0.01637

Passive power(pJ) for S0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00996	0.01041	0.02884
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00914	0.00971	0.02846

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00395	0.00392	1.51642
sky130_osu_sc_15T_ms__nand2_l	0.00295	0.00295	0.98533

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.06035	0.24089
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00937	0.03682

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.02859	0.71332	10.23070
	B->Y (FR)	0.03373	0.70805	10.08120
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.03758	0.85205	11.04220
	B->Y (FR)	0.04498	0.85642	11.01800

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (RF)	0.03472	0.76481	10.99660
	B->Y (RF)	0.03972	0.75030	10.66900
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.03732	0.77933	10.01380
	B->Y (RF)	0.04176	0.76007	9.63163

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00515	0.00536	0.00762
	B	0.00000	0.00000	0.00000
	B	0.00653	0.00661	0.00881
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00380	0.00389	0.00517
	B	0.00000	0.00000	0.00000
	B	0.00478	0.00479	0.00612

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00068	-0.00073	0.00005
	B	0.00000	0.00000	0.00000
	B	-0.00064	-0.00075	-0.00020
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00045	0.00023
	B	0.00000	0.00000	0.00000
	B	-0.00041	-0.00049	0.00000

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00345	-0.00346	-0.00348
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00238	-0.00239	-0.00240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00347	0.00355	0.00349
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00239	0.00245	0.00241

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00320	-0.00321	-0.00321
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00222	-0.00222	-0.00222

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00323	0.00325	0.00321
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00224	0.00227	0.00223

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00392	0.00421	0.91292
sky130_osu_sc_15T_ms__nor2_l	0.00285	0.00317	0.56852

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.04414	0.12045
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00729	0.01841

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.06031	0.87676	10.75040
	B->Y (FR)	0.04676	0.86250	10.81510
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.07328	1.00084	10.77420
	B->Y (FR)	0.06117	0.99451	10.96480

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (RF)	0.03243	0.53151	6.68959
	B->Y (RF)	0.02542	0.51931	6.67190
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.03185	0.52215	5.94894
	B->Y (RF)	0.02684	0.51243	5.93406

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00687	0.00680	0.00786
	B	0.00000	0.00000	0.00000
	B	0.00532	0.00534	0.00825
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00486	0.00479	0.00566
	B	0.00000	0.00000	0.00000
	B	0.00390	0.00390	0.00586

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00077	0.00060	0.00167
	B	0.00000	0.00000	0.00000
	B	-0.00080	-0.00075	0.00034
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00045	0.00037	0.00140
	B	0.00000	0.00000	0.00000
	B	-0.00045	-0.00042	0.00059

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00256	-0.00302	-0.00305
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00174	-0.00201	-0.00202

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00303	0.00306	0.00305
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00201	0.00202	0.00202

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00151	-0.00154	-0.00151
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00099	-0.00100	-0.00099

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00158	0.00159	0.00154
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00103	0.00104	0.00100

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00395	0.00403	0.00335	0.89263

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.02906	0.13886

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.06544	0.89035	10.87750
	A1->Y (FR)	0.08282	0.90976	10.83070
	B0->Y (FR)	0.04430	0.79108	9.99410

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (RF)	0.04837	0.64553	7.86461
	A1->Y (RF)	0.05764	0.63796	7.66364
	B0->Y (RF)	0.03766	0.66891	8.47684

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00727	0.00731	0.00981
	A1	0.00000	0.00000	0.00000
	A1	0.00885	0.00873	0.00970
	B0	0.00588	0.00585	0.00761

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00017	0.00005	0.00074
	A1	0.00000	0.00000	0.00000
	A1	0.00173	0.00144	0.00214
	B0	0.00240	0.00232	0.00308

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00151	-0.00155	-0.00152
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00302	-0.00308	-0.00306
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00311	-0.00312	-0.00312

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00160	0.00161	0.00154
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00305	0.00308	0.00306
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00311	0.00313	0.00313

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00247	-0.00297	-0.00298
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00298	-0.00305	-0.00303
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00307	-0.00308	-0.00308

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00296	0.00297	0.00298
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00301	0.00305	0.00303
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00307	0.00312	0.00308

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00245	-0.00246	-0.00250

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00250	0.00252	0.00251

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00382	0.00404	0.00416	0.00407	0.91336

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.06622	0.24089

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.08981	0.90948	10.80090
	A1->Y (FR)	0.07585	0.89330	10.86560
	B0->Y (FR)	0.05221	0.86990	10.85310
	B1->Y (FR)	0.06725	0.88639	10.79100

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (RF)	0.08151	0.69405	8.05874
	A1->Y (RF)	0.06554	0.67190	7.99523
	B0->Y (RF)	0.05534	0.69703	8.60476
	B1->Y (RF)	0.07199	0.72318	8.70594

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.01147	0.01135	0.01227
	A1	0.00985	0.00982	0.01234
	B0	0.00722	0.00728	0.00979
	B1	0.00891	0.00882	0.00976

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00286	0.00259	0.00320
	A1	0.00146	0.00127	0.00190
	B0	-0.00033	-0.00033	0.00070
	B1	0.00288	0.00265	0.00357

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00255	-0.00302	-0.00305
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00255	-0.00302	-0.00305
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00300	-0.00305	-0.00304
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00308	-0.00310	-0.00309

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00302	0.00306	0.00305
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00302	0.00306	0.00305
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00302	0.00306	0.00304
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00308	0.00311	0.00309

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00150	-0.00153	-0.00150
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00149	-0.00153	-0.00150
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00297	-0.00300	-0.00301
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00306	-0.00308	-0.00306

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00158	0.00158	0.00153
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00157	0.00158	0.00153
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00300	0.00300	0.00301
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00306	0.00308	0.00307

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00148	-0.00149	-0.00149
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00148	-0.00149	-0.00149
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00334	-0.00339	-0.00337
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00334	-0.00337	-0.00342

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00156	0.00157	0.00151
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00156	0.00157	0.00151
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00336	0.00339	0.00337
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00341	0.00345	0.00343

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00250	-0.00296	-0.00299
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00250	-0.00296	-0.00299
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00341	-0.00346	-0.00345
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00341	-0.00342	-0.00349

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00297	0.00301	0.00299
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00297	0.00300	0.00299
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00344	0.00348	0.00345
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00348	0.00351	0.00350

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00428	0.00404	1.80110
sky130_osu_sc_15T_ms__or2_2	0.00428	0.00404	3.55709
sky130_osu_sc_15T_ms__or2_4	0.00429	0.00404	6.83311
sky130_osu_sc_15T_ms__or2_8	0.00428	0.00405	13.10669
sky130_osu_sc_15T_ms__or2_l	0.00326	0.00301	1.02212

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.07441	0.12087
sky130_osu_sc_15T_ms__or2_2	0.00000	0.10468	0.24132
sky130_osu_sc_15T_ms__or2_4	0.00000	0.16523	0.48222
sky130_osu_sc_15T_ms__or2_8	0.00000	0.28631	0.96401
sky130_osu_sc_15T_ms__or2_l	0.00000	0.01212	0.01903

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.07250	0.63454	6.99174
	B->Y (RR)	0.06323	0.60069	6.92306
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.08008	0.57118	7.09217
	B->Y (RR)	0.07050	0.54431	7.02252
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.10471	0.57087	7.37088
	B->Y (RR)	0.09498	0.54838	7.29607
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.15134	0.62402	7.82055
	B->Y (RR)	0.14159	0.60691	7.75645
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.08015	0.72858	6.79140
	B->Y (RR)	0.07168	0.69839	6.69893

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (FF)	0.11849	0.68471	6.89508
	B->Y (FF)	0.09975	0.65089	6.79332
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.14118	0.66539	7.11354
	B->Y (FF)	0.12259	0.64222	6.97809
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.19901	0.71280	7.51289
	B->Y (FF)	0.18049	0.69895	7.36210
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.31610	0.83774	7.96593
	B->Y (FF)	0.29762	0.82491	7.83334
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.13905	0.69756	5.75299
	B->Y (FF)	0.11794	0.67226	5.68200

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00532	0.00472	0.01288
	B	0.00000	0.00000	0.00000
	B	0.00389	0.00375	0.01538
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00902	0.00870	0.01711
	B	0.00000	0.00000	0.00000
	B	0.00752	0.00773	0.01880
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01711	0.01736	0.02582
	B	0.00000	0.00000	0.00000
	B	0.01562	0.01652	0.02784
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03371	0.03453	0.04530
	B	0.00000	0.00000	0.00000
	B	0.03213	0.03405	0.04699
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00382	0.00345	0.01124
	B	0.00000	0.00000	0.00000
	B	0.00291	0.00283	0.01006

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01135	0.01118	0.01867
	B	0.00000	0.00000	0.00000
	B	0.00947	0.01018	0.02595
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01386	0.01419	0.02149
	B	0.00000	0.00000	0.00000
	B	0.01197	0.01304	0.02811
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02031	0.02133	0.02845
	B	0.00000	0.00000	0.00000
	B	0.01844	0.01990	0.03423
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03499	0.03514	0.04244
	B	0.00000	0.00000	0.00000
	B	0.03308	0.03431	0.04785
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00839	0.00807	0.01370
	B	0.00000	0.00000	0.00000
	B	0.00708	0.00744	0.01732

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00256	-0.00303	-0.00307
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00256	-0.00303	-0.00307
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00256	-0.00303	-0.00307
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00256	-0.00303	-0.00307
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00175	-0.00204	-0.00204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00309	0.00307
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00304	0.00307
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00305	0.00307
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00304	0.00305	0.00307
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00203	0.00204	0.00204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00152	-0.00155	-0.00152
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00152	-0.00155	-0.00152
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00155	-0.00152
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00155	-0.00152
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00101	-0.00103	-0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00154
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00155
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00155
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00154
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00106	0.00107	0.00103

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00419	0.00539	0.92084
sky130_osu_sc_15T_ms__tbufi_l	0.00317	0.00412	0.56858

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.06049	0.24090
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.00957	0.03682

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.04413	0.85782	10.81450
	OE->Y (FR)	0.04583	0.34223	4.86209
	OE->Y (RR)	0.08210	0.72714	6.98473
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.05875	0.99342	10.97060
	OE->Y (FR)	0.05318	0.34213	4.86187
	OE->Y (RR)	0.09353	0.84447	6.86543

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.03389	0.63982	8.17737
	OE->Y (FF)	0.04656	0.34226	4.86207
	OE->Y (RF)	0.03323	0.61944	7.79618
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.03702	0.63743	7.30270
	OE->Y (FF)	0.05386	0.34213	4.86188
	OE->Y (RF)	0.03536	0.61239	6.86331

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00496	0.00506	0.00761
	OE	0.00000	0.00000	0.00000
	OE	0.00482	0.00471	0.02027
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00366	0.00365	0.00544
	OE	0.00000	0.00000	0.00000
	OE	0.00341	0.00332	0.01448

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00080	-0.00077	0.00022
	OE	0.00000	0.00000	0.00000
	OE	0.00314	0.00297	0.02096
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00044	0.00048
	OE	0.00000	0.00000	0.00000
	OE	0.00212	0.00200	0.01424

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00247	-0.00251	-0.00248
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00221	-0.00222	-0.00221
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00177	-0.00180	-0.00178
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00159	-0.00160	-0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00247	0.00251	0.00248
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00226	0.00226	0.00223
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00177	0.00180	0.00178
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00162	0.00164	0.00160

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00185	0.00172	0.02004
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00165	0.00153	0.01980
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00122	0.00112	0.01348
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00107	0.00098	0.01331

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00588	0.00614	0.02493
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00588	0.00621	0.02503
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00446	0.00455	0.01701
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00451	0.00466	0.01707

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tnbufi_1	0.00418	0.00642	0.91959
sky130_osu_sc_15T_ms__tnbufi_l	0.00316	0.00462	0.56843

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.10057	0.12067
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.01561	0.01872

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (FR)	0.04460	0.85741	10.80520
	OE->Y (RR)	0.02999	0.34279	4.86259
	OE->Y (FR)	0.05611	0.87042	10.73660
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.05920	0.98955	10.96860
	OE->Y (RR)	0.03002	0.34272	4.86260
	OE->Y (FR)	0.06934	0.99838	10.78120

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (RF)	0.03332	0.63931	8.17115
	OE->Y (RF)	0.02976	0.34279	4.86259
	OE->Y (FF)	0.05820	0.55218	5.28379
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.03631	0.63698	7.30138
	OE->Y (RF)	0.02980	0.34274	4.86253
	OE->Y (FF)	0.06674	0.58195	4.75842

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00510	0.00520	0.00776
	OE	0.00000	0.00000	0.00000
	OE	0.01231	0.01307	0.03259
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00381	0.00361	0.00559
	OE	0.00000	0.00000	0.00000
	OE	0.00886	0.00927	0.02221

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00099	-0.00095	0.00004
	OE	0.00000	0.00000	0.00000
	OE	0.01082	0.01173	0.02860
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00064	-0.00062	0.00030
	OE	0.00000	0.00000	0.00000
	OE	0.00772	0.00821	0.01973

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00210	-0.00213	-0.00211
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00186	-0.00187	-0.00186
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00141	-0.00141	-0.00142
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00125	-0.00126	-0.00125

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00210	0.00213	0.00211
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00190	0.00190	0.00188
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00141	0.00141	0.00142
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00128	0.00129	0.00126

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00352	-0.00401	0.01483
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00355	-0.00394	0.01487
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00227	-0.00254	0.01005
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00226	-0.00256	0.01008

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00931	0.01021	0.02961
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00918	0.01012	0.02943
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00667	0.00715	0.02002
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00657	0.00710	0.01992

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00831	0.00739	0.96595

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.20789	0.36156

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (RR)	B	0.10353	0.77743	7.34574
	A->Y (FR)	!B	0.05896	0.88610	11.09100
	B->Y (RR)	A	0.08343	0.75537	7.35269
	B->Y (FR)	!A	0.07796	0.90335	11.03410

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (FF)	B	0.09991	0.64391	5.71965
	A->Y (RF)	!B	0.04718	0.64050	8.02126
	B->Y (FF)	A	0.08632	0.63108	5.71529
	B->Y (RF)	!A	0.05875	0.65464	8.02888

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00486	0.00456	0.01978
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01232	0.01267	0.03417
	B	A	0.00000	0.00000	0.00000
	B	A	0.00181	0.00181	0.01980
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01332	0.01372	0.03326

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01507	0.01498	0.03326
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00321	0.00286	0.02113
	B	A	0.00000	0.00000	0.00000
	B	A	0.01351	0.01413	0.03307
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00438	0.00394	0.02218

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

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_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00834	0.00744	0.93122

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.20789	0.34804

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.10307	0.76537	7.22261
	A->Y (FR)	B	0.07267	0.89395	10.92020
	B->Y (RR)	!A	0.08781	0.75745	7.23128
	B->Y (FR)	A	0.07976	0.90177	10.91170

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (FF)	!B	0.09009	0.63077	5.51876
	A->Y (RF)	B	0.04877	0.66486	8.24155
	B->Y (FF)	!A	0.08421	0.62439	5.56542
	B->Y (RF)	A	0.05800	0.64878	7.86987

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01436	0.01478	0.03449
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00268	0.00176	0.01898
	B	A	0.00000	0.00000	0.00000
	B	A	0.01470	0.01518	0.03460
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00168	0.00158	0.01939

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00287	0.00229	0.02097
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01537	0.01585	0.03257
	B	A	0.00000	0.00000	0.00000
	B	A	0.00291	0.00238	0.02049
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01372	0.01444	0.03326

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P68_25C.ccs
Cell Library: Process , Voltage 1.68,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.52018
sky130_osu_sc_15T_ms__tiehi	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__ant	0.00000	216293.00000	432585.00000
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_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_15T_ms__ant	0.00000	0.00000	0.00000
	-0.00180	0.05327	0.74788

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	3.76448	3.57052	0.91400