sky130_osu_sc_15T_ms_ff_1P95_-40C.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_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.01486	0.01483	0.01143	2.96437	1.40437	2.78309
sky130_osu_sc_15T_ms__addf_l	0.01486	0.01482	0.01141	1.69147	1.40590	1.76664

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.12477	0.17312
sky130_osu_sc_15T_ms__addf_l	0.00000	0.11710	0.16545

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)	0.08847	1.30535	24.17330
	B->CO (RR)	0.07731	1.25059	23.21550
	CI->CO (RR)	0.08328	1.32135	24.50660
	CON->CO (FR)	0.01648	0.58585	10.58020
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.09262	1.18309	17.82260
	B->CO (RR)	0.08146	1.13989	17.28520
	CI->CO (RR)	0.08735	1.20179	18.23810
	CON->CO (FR)	0.02073	0.66359	10.47790

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)	0.11394	1.59401	29.37850
	B->CO (FF)	0.10022	1.51503	27.91250
	CI->CO (FF)	0.09911	1.59437	29.65080
	CON->CO (RF)	0.01574	0.50847	9.28257
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.10791	1.27731	19.08490
	B->CO (FF)	0.09438	1.21788	18.38630
	CI->CO (FF)	0.09313	1.27991	19.41630
	CON->CO (RF)	0.01615	0.46249	7.30117

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)	0.08962	0.71727	9.80339
	B->CON (FR)	0.07565	0.67813	9.48165
	CI->CON (FR)	0.07480	0.71898	10.15820
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.08514	0.71312	9.80603
	B->CON (FR)	0.07163	0.67445	9.48346
	CI->CON (FR)	0.07031	0.71808	10.16070

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)	0.05954	0.49927	6.81451
	B->CON (RF)	0.04867	0.47939	6.68338
	CI->CON (RF)	0.05431	0.52046	7.25795
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.05692	0.49617	6.81682
	B->CON (RF)	0.04628	0.47698	6.68558
	CI->CON (RF)	0.05166	0.51801	7.26026

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)	0.16713	1.40431	23.03640
	B->S (-R)	0.17125	1.37218	21.95050
	CI->S (-R)	0.15123	1.40318	23.31740
	CON->S (RR)	0.05021	0.45484	6.84355
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.16221	1.28844	18.15740
	B->S (-R)	0.16654	1.27092	17.54030
	CI->S (-R)	0.14622	1.28874	18.47810
	CON->S (RR)	0.05159	0.50854	6.70301

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)	0.14208	1.17015	18.62100
	B->S (-F)	0.14245	1.13576	18.01460
	CI->S (-F)	0.13627	1.18498	18.95750
	CON->S (FF)	0.05886	0.51627	7.31366
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.13150	1.01347	13.76100
	B->S (-F)	0.13243	0.98786	13.44990
	CI->S (-F)	0.12576	1.02971	14.16950
	CON->S (FF)	0.05441	0.49229	6.16111

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	0.00373	0.00617	0.06359
	B	0.00435	0.00643	0.05802
	CI	0.00565	0.00815	0.06610
sky130_osu_sc_15T_ms__addf_l	A	0.00276	0.00444	0.03718
	B	0.00341	0.00469	0.03487
	CI	0.00468	0.00651	0.04055

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01431	0.01768	0.10556
	B	0.01493	0.01746	0.09472
	CI	0.01211	0.01588	0.10624
sky130_osu_sc_15T_ms__addf_l	A	0.01338	0.01558	0.06580
	B	0.01399	0.01560	0.05997
	CI	0.01118	0.01388	0.06696

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01429	0.01621	0.06064
	B	0.01460	0.01630	0.05640
	CI	0.01210	0.01437	0.06277
sky130_osu_sc_15T_ms__addf_l	A	0.01335	0.01526	0.05839
	B	0.01370	0.01534	0.05449
	CI	0.01117	0.01364	0.06046

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00434	0.00522	0.03223
	B	0.00434	0.00566	0.03402
	CI	0.00563	0.00742	0.04015
sky130_osu_sc_15T_ms__addf_l	A	0.00339	0.00417	0.02896
	B	0.00340	0.00451	0.03066
	CI	0.00467	0.00623	0.03629

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01430	0.01752	0.09983
	B	-0.00483	-0.00317	0.05551
	CI	0.01210	0.01574	0.10057
sky130_osu_sc_15T_ms__addf_l	A	-0.00263	-0.00337	0.07271
	B	-0.00638	-0.00459	0.06581
	CI	0.00337	0.00458	0.07787

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.03154	0.03322	0.09809
	B	0.02792	0.03090	0.11871
	CI	0.02345	0.02538	0.08792
sky130_osu_sc_15T_ms__addf_l	A	0.03023	0.03180	0.09939
	B	0.02665	0.02986	0.12154
	CI	0.02214	0.02392	0.08900

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00725	0.00810	2.85366	1.55286	2.93018
sky130_osu_sc_15T_ms__addh_l	0.00725	0.00810	1.79333	1.55505	1.83210

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.14829	0.17305
sky130_osu_sc_15T_ms__addh_l	0.00000	0.13866	0.16536

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)	0.05839	0.45368	6.58602
	B->CO (RR)	0.06108	0.45649	6.73989
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.06090	0.51034	6.53512
	B->CO (RR)	0.06361	0.51267	6.61596

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)	0.05049	0.48646	7.20796
	B->CO (FF)	0.05474	0.49905	7.23574
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.04706	0.43009	5.38521
	B->CO (FF)	0.05096	0.44179	5.41352

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	0.08156	0.36634	3.50171
	A->CON (FR)	!B	0.04665	0.66894	9.99691
	B->CON (RR)	A	0.08407	0.36845	3.66037
	B->CON (FR)	!A	0.05822	0.67349	9.85489
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.07549	0.35624	3.55612
	A->CON (FR)	!B	0.04276	0.66518	10.00170
	B->CON (RR)	A	0.07803	0.35816	3.64677
	B->CON (FR)	!A	0.05432	0.66953	9.86119

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	0.08083	0.50111	5.77394
	A->CON (RF)	!B	0.03460	0.50413	7.51427
	B->CON (FF)	A	0.07947	0.52840	6.11925
	B->CON (RF)	!A	0.04106	0.48751	7.10579
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.07529	0.48940	5.73360
	A->CON (RF)	!B	0.03225	0.50162	7.51760
	B->CON (FF)	A	0.07393	0.51638	6.07421
	B->CON (RF)	!A	0.03874	0.48518	7.10979

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	0.06082	1.26061	23.72840
	A->S (FR)	B	0.10762	1.24600	21.75110
	B->S (RR)	!A	0.06763	1.21377	22.60140
	B->S (FR)	A	0.10643	1.30470	22.82980
	CON->S (FR)	-	0.01841	0.60045	10.81310
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.06223	1.16831	18.64220
	A->S (FR)	B	0.10598	1.14353	16.64140
	B->S (RR)	!A	0.06913	1.12963	17.84910
	B->S (FR)	A	0.10469	1.19345	17.38390
	CON->S (FR)	-	0.02125	0.67368	10.84040

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	0.06832	1.42946	26.84170
	A->S (RF)	B	0.10173	0.96124	16.24680
	B->S (FF)	!A	0.07991	1.43662	26.77240
	B->S (RF)	A	0.10422	0.96315	16.40330
	CON->S (RF)	-	0.01473	0.49257	8.96556
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.06369	1.20404	19.17410
	A->S (RF)	B	0.09509	0.81298	11.20280
	B->S (FF)	!A	0.07526	1.20923	19.04680
	B->S (RF)	A	0.09762	0.81453	11.28340
	CON->S (RF)	-	0.01512	0.46804	7.56317

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	0.00674	0.00767	0.03659
	B	0.00000	0.00000	0.00000
	B	0.00608	0.00685	0.05090
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00584	0.00683	0.04099
	B	0.00000	0.00000	0.00000
	B	0.00519	0.00597	0.04637

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	0.01005	0.01181	0.06099
	B	0.00000	0.00000	0.00000
	B	0.01052	0.01306	0.06555
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00922	0.01084	0.05533
	B	0.00000	0.00000	0.00000
	B	0.00967	0.01187	0.05778

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	0.00674	0.00771	0.03713
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00905	0.01054	0.02947
	B	A	0.00000	0.00000	0.00000
	B	A	0.00608	0.00685	0.04721
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01011	0.01066	0.02457
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00584	0.00682	0.04095
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00842	0.00980	0.02640
	B	A	0.00000	0.00000	0.00000
	B	A	0.00518	0.00598	0.04661
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00949	0.00989	0.02154

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	0.01006	0.01171	0.05690
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00127	0.00218	0.01715
	B	A	0.00000	0.00000	0.00000
	B	A	0.01052	0.01290	0.06093
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00231	0.00298	0.01705
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00921	0.01082	0.05475
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00047	0.00111	0.01179
	B	A	0.00000	0.00000	0.00000
	B	A	0.00968	0.01186	0.05744
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00151	0.00196	0.01211

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	0.01007	0.01184	0.06182
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00128	0.00237	0.02104
	B	A	0.00000	0.00000	0.00000
	B	A	0.01053	0.01310	0.06617
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00234	0.00334	0.01918
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00922	0.01085	0.05565
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00048	0.00124	0.01164
	B	A	0.00000	0.00000	0.00000
	B	A	0.00968	0.01191	0.05863
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00154	0.00213	0.01248

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	0.00674	0.00770	0.03728
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00907	0.01066	0.03027
	B	A	0.00000	0.00000	0.00000
	B	A	0.00608	0.00689	0.04676
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01014	0.01087	0.02683
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00584	0.00686	0.04114
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00843	0.00983	0.02589
	B	A	0.00000	0.00000	0.00000
	B	A	0.00519	0.00600	0.04646
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00950	0.00997	0.02119

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00393	0.00403	2.91026
sky130_osu_sc_15T_ms__and2_2	0.00393	0.00404	5.53879
sky130_osu_sc_15T_ms__and2_4	0.00393	0.00404	10.57395
sky130_osu_sc_15T_ms__and2_6	0.00397	0.00404	15.41920
sky130_osu_sc_15T_ms__and2_8	0.00395	0.00406	19.63988
sky130_osu_sc_15T_ms__and2_l	0.00301	0.00312	1.68772

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.07207	0.11525
sky130_osu_sc_15T_ms__and2_2	0.00000	0.11528	0.11534
sky130_osu_sc_15T_ms__and2_4	0.00000	0.20170	0.23047
sky130_osu_sc_15T_ms__and2_6	0.00000	0.28812	0.34563
sky130_osu_sc_15T_ms__and2_8	0.00000	0.37454	0.46080
sky130_osu_sc_15T_ms__and2_l	0.00000	0.06245	0.09984

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)	0.04452	0.41610	6.73329
	B->Y (RR)	0.04801	0.41556	6.46190
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.05140	0.36566	6.61167
	B->Y (RR)	0.05491	0.36435	6.34265
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.07108	0.36789	6.76168
	B->Y (RR)	0.07458	0.36499	6.51793
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.09105	0.39006	6.84005
	B->Y (RR)	0.09449	0.38491	6.61714
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.11099	0.41734	6.86806
	B->Y (RR)	0.11449	0.40991	6.65266
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.04842	0.45495	5.99583
	B->Y (RR)	0.05204	0.45500	5.72459

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)	0.04003	0.44172	6.82867
	B->Y (FF)	0.04220	0.45018	6.83398
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.04469	0.39708	6.65633
	B->Y (FF)	0.04729	0.40560	6.68819
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.06098	0.40130	6.69921
	B->Y (FF)	0.06322	0.40651	6.74085
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.07943	0.42466	6.72539
	B->Y (FF)	0.08118	0.42856	6.76990
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.09662	0.44659	6.60251
	B->Y (FF)	0.09815	0.44969	6.64877
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.04464	0.46434	5.92896
	B->Y (FF)	0.04816	0.47519	5.95174

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	0.00454	0.00929	0.13720
	B	0.00000	0.00000	0.00000
	B	0.00461	0.00704	0.08790
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00931	0.01369	0.14182
	B	0.00000	0.00000	0.00000
	B	0.00939	0.01186	0.09256
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02030	0.02409	0.14810
	B	0.00000	0.00000	0.00000
	B	0.02041	0.02267	0.09980
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03322	0.03547	0.15714
	B	0.00000	0.00000	0.00000
	B	0.03336	0.03399	0.10732
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04745	0.04859	0.16754
	B	0.00000	0.00000	0.00000
	B	0.04748	0.04603	0.11480
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00329	0.00652	0.09735
	B	0.00000	0.00000	0.00000
	B	0.00337	0.00497	0.06059

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	0.01227	0.01869	0.12971
	B	0.00000	0.00000	0.00000
	B	0.01388	0.01953	0.12173
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01600	0.02306	0.13340
	B	0.00000	0.00000	0.00000
	B	0.01764	0.02323	0.12615
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02652	0.03179	0.14164
	B	0.00000	0.00000	0.00000
	B	0.02800	0.03270	0.13444
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03792	0.04219	0.15057
	B	0.00000	0.00000	0.00000
	B	0.03931	0.04247	0.14341
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.05235	0.05188	0.15949
	B	0.00000	0.00000	0.00000
	B	0.05341	0.05221	0.15149
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00944	0.01406	0.08718
	B	0.00000	0.00000	0.00000
	B	0.01063	0.01500	0.08220

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)	-0.00452	-0.00453	-0.00455
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00453	-0.00455
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00453	-0.00455
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00455	-0.00456	-0.00458
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00452	-0.00453	-0.00454
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00320	-0.00321	-0.00322

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)	0.00454	0.00464	0.00456
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00454	0.00464	0.00456
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00454	0.00464	0.00456
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00457	0.00467	0.00460
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00454	0.00464	0.00456
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00321	0.00328	0.00323

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)	-0.00424	-0.00426	-0.00425
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00424	-0.00427	-0.00426
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00424	-0.00427	-0.00425
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00424	-0.00427	-0.00425
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00424	-0.00427	-0.00425
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00301	-0.00304	-0.00302

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)	0.00428	0.00433	0.00427
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00428	0.00433	0.00427
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00428	0.00433	0.00427
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00428	0.00433	0.00427
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00428	0.00433	0.00427
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00306	0.00305	0.00303

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00371	0.00387	0.00375	1.32326

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.02583	0.05758

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)	0.04836	0.67876	9.65991
	A1->Y (FR)	0.03974	0.63874	9.20443
	B0->Y (FR)	0.03506	0.68876	10.05440

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)	0.03161	0.44302	6.24074
	A1->Y (RF)	0.02819	0.44781	6.38596
	B0->Y (RF)	0.01868	0.42276	6.18102

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	0.01094	0.01132	0.02831
	A1	0.00000	0.00000	0.00000
	A1	0.00905	0.00941	0.02639
	B0	0.00643	0.00937	0.04752

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	0.00214	0.00218	0.01256
	A1	0.00000	0.00000	0.00000
	A1	0.00221	0.00264	0.01596
	B0	-0.00114	0.00013	0.01781

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)	-0.00329	-0.00389	-0.00387
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00391	-0.00395	-0.00392
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00391	-0.00394	-0.00392

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)	0.00386	0.00389	0.00387
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00391	0.00397	0.00393
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00395	0.00397	0.00393

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)	-0.00327	-0.00382	-0.00381
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00384	-0.00387	-0.00385
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00422	-0.00425	-0.00425

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)	0.00379	0.00382	0.00381
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00384	0.00390	0.00386
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00424	0.00433	0.00426

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)	-0.00175	-0.00178	-0.00176

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)	0.00187	0.00189	0.00179

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__aoi22_1	0.00370	0.00385	0.00399	0.00379	1.35631

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_1	0.00000	0.02828	0.11516

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)	0.05873	0.68366	9.61960
	A1->Y (FR)	0.05199	0.66843	9.50265
	B0->Y (FR)	0.03533	0.66969	9.83079
	B1->Y (FR)	0.04223	0.68922	10.03180

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)	0.04113	0.45803	6.35784
	A1->Y (RF)	0.03766	0.46323	6.50539
	B0->Y (RF)	0.02038	0.44108	6.49178
	B1->Y (RF)	0.02396	0.43615	6.34474

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	0.01333	0.01360	0.03138
	A1	0.01147	0.01172	0.02922
	B0	0.00702	0.00946	0.04132
	B1	0.00888	0.01130	0.04251

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00452	0.00452	0.01541
	A1	0.00457	0.00502	0.01873
	B0	-0.00084	0.00007	0.01357
	B1	-0.00074	-0.00038	0.01023

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)	-0.00338	-0.00389	-0.00387
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00391	-0.00393	-0.00392
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00391	-0.00393	-0.00392
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00391	-0.00394	-0.00392

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)	0.00385	0.00389	0.00387
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00392	0.00397	0.00393
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00395	0.00397	0.00393
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00395	0.00397	0.00393

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)	-0.00334	-0.00383	-0.00381
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00383	-0.00387	-0.00385
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00422	-0.00422	-0.00424
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00422	-0.00421	-0.00424

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)	0.00379	0.00384	0.00381
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00384	0.00390	0.00386
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00423	0.00433	0.00425
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00423	0.00433	0.00425

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)	-0.00176	-0.00181	-0.00177
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00176	-0.00178	-0.00177
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00438	-0.00439	-0.00441
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00438	-0.00440	-0.00441

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)	0.00193	0.00195	0.00181
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00176	0.00178	0.00177
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00439	0.00439	0.00442
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00439	0.00440	0.00442

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)	-0.00178	-0.00181	-0.00179
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00177	-0.00179	-0.00178
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00400	-0.00403	-0.00400
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00400	-0.00403	-0.00400

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)	0.00195	0.00196	0.00182
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00177	0.00179	0.00178
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00403	0.00404	0.00401
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00403	0.00404	0.00401

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

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	0.00403	2.82466
sky130_osu_sc_15T_ms__buf_2	0.00407	5.49500
sky130_osu_sc_15T_ms__buf_4	0.00406	10.61712
sky130_osu_sc_15T_ms__buf_6	0.00090	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00408	20.17296
sky130_osu_sc_15T_ms__buf_l	0.00315	1.68507

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.05767	0.05767
sky130_osu_sc_15T_ms__buf_2	0.00000	0.08651	0.11525
sky130_osu_sc_15T_ms__buf_4	0.00000	0.14418	0.23042
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.25952	0.46075
sky130_osu_sc_15T_ms__buf_l	0.00000	0.05000	0.05000

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)**	0.03654	0.39200	6.29229
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.04226	0.34094	6.23130
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.05762	0.33756	6.41105
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.08824	0.37788	6.59577
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.04069	0.42938	5.61426

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)**	0.03767	0.43108	6.69871
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.04365	0.40646	6.93985
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.06000	0.41203	7.16140
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.09561	0.45789	7.24407
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.04267	0.45961	5.96628

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	0.00425	0.00815	0.09548
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00885	0.01235	0.09793
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01948	0.02298	0.10784
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04401	0.04654	0.12552
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00319	0.00587	0.07109

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	0.01167	0.01785	0.12671
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01547	0.02134	0.11753
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02563	0.03136	0.12707
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.05082	0.05014	0.14594
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00905	0.01346	0.08631

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
	-0.00085	-0.00085	-0.00083

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
	0.00085	0.00085	0.00083

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00382	0.00379	0.01117	2.54916	2.53486
sky130_osu_sc_15T_ms__dffr_l	0.00382	0.00379	0.01115	1.70260	1.69502

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.18381	0.26677
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.17614	0.25910

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)	0.18033	0.99774	14.46180
	QN->Q (FR)	0.02170	0.71259	12.46010
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.17323	1.04563	13.27230
	QN->Q (FR)	0.02367	0.75410	11.93570

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)	0.17481	0.99242	14.71550
	QN->Q (RF)	0.01803	0.56456	9.83918
	RN->Q (FF)	0.13015	1.03567	15.96800
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.17697	1.06019	13.60250
	QN->Q (RF)	0.01752	0.52707	8.34912
	RN->Q (FF)	0.13254	1.10280	14.85300

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)	0.15499	0.53321	6.18462
	RN->QN (FR)	0.11031	0.57635	7.43576
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.15688	0.59237	6.20098
	RN->QN (FR)	0.11237	0.63497	7.44840

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)**	0.15408	0.49084	5.09066
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.14288	0.47494	4.25584

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)	-0.04346	-0.05509	-0.01240
	setup	CK (R)	0.14702	0.17865	0.39745
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.04035	-0.05509	-0.01269
	setup	CK (R)	0.14935	0.18019	0.38578

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)	-0.06336	-0.21471	-2.20249
	setup	CK (R)	0.08269	0.22422	3.22813
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06535	-0.21310	-2.28661
	setup	CK (R)	0.08269	0.22422	3.22749

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)	-0.04346	-0.05509	-0.01240
	setup	CK (R)	0.14702	0.17865	0.39745
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.04035	-0.05509	-0.01269
	setup	CK (R)	0.14935	0.18019	0.38578

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)	-0.06336	-0.21471	-2.20249
	setup	CK (R)	0.08269	0.22422	3.22813
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06535	-0.21310	-2.28661
	setup	CK (R)	0.08269	0.22422	3.22749

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)	0.12876	0.16005	0.79547
	removal	CK (R)	-0.03140	-0.04120	-0.14581
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12961	0.16150	0.78953
	removal	CK (R)	-0.03140	-0.04120	-0.14581

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)	0.12876	0.16005	0.79547
	removal	CK (R)	-0.03140	-0.04120	-0.14581
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.12961	0.16150	0.78953
	removal	CK (R)	-0.03140	-0.04120	-0.14581

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 ()	0.07250	0.42602	13.33370
	min_pulse_width	RN ()	0.07250	0.42602	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.07250	0.42602	13.33370
	min_pulse_width	RN ()	0.07250	0.42602	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 ()	0.08535	0.42602	13.33370
	min_pulse_width	CK ()	0.08857	0.42602	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.07893	0.42602	13.33370
	min_pulse_width	CK ()	0.08535	0.42602	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 ()	0.18177	0.42602	13.33370
	min_pulse_width	CK ()	0.06607	0.42602	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.18498	0.42602	13.33370
	min_pulse_width	CK ()	0.06607	0.42602	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	0.01193	0.01146	0.02333
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01048	0.01149	0.06236

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	0.01363	0.01056	-0.00894
	RN	-0.00152	-0.12685	-2.42329
	RN	0.03180	0.02951	0.01216
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01223	0.01162	0.04496
	RN	-0.00152	-0.09957	-1.61854
	RN	0.03037	0.03060	0.06509

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	0.01362	0.01055	-0.00785
	RN	-0.00152	-0.12643	-2.40964
	RN	0.03179	0.02956	0.01227
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01223	0.01162	0.04563
	RN	-0.00152	-0.09930	-1.61133
	RN	0.03037	0.03056	0.06556

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	0.01189	0.01140	0.02341
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01043	0.01148	0.06125

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	-0.00322	-0.00382	-0.00384
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01508	0.01664	0.09922
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00623	0.00797	0.08954
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00322	-0.00382	-0.00384
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01508	0.01664	0.09921
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00623	0.00797	0.08954

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	0.00382	0.00385	0.00384
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02390	0.02624	0.11054
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01162	0.01390	0.09577
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00382	0.00385	0.00384
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02390	0.02624	0.11054
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01162	0.01390	0.09577

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)	0.00427	0.00909	0.14931
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01338	0.01800	0.16341
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)	0.00427	0.00909	0.14931
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01337	0.01800	0.16340

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)	0.01175	0.01801	0.15830
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02404	0.02989	0.17516
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)	0.01174	0.01801	0.15830
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02403	0.02988	0.17515

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)	-0.00113	0.00326	0.14389
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00747	0.01082	0.16057
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00152	0.00287	0.14302
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00113	0.00326	0.14389
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00747	0.01081	0.16057
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00152	0.00287	0.14302

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)	0.01746	0.02442	0.16467
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03773	0.04295	0.22321
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02848	0.03384	0.18184
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03636	0.04901	0.27168
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01957	0.02575	0.16554
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01746	0.02442	0.16467
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03773	0.04295	0.22321
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02848	0.03384	0.18184
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03637	0.04903	0.27169
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01957	0.02575	0.16554

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00377	0.00379	0.00842	0.01145	2.96021	2.94500
sky130_osu_sc_15T_ms__dffsr_l	0.00377	0.00379	0.00841	0.01145	1.69431	1.70235

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.19068	0.26674
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.18300	0.25907

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)	0.17575	1.02271	15.95610
	QN->Q (FR)	0.01862	0.65156	11.80650
	RN->Q (RR)	0.14393	1.00367	16.10610
	SN->Q (FR)	0.12778	1.08023	17.48520
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.17485	1.04282	13.14520
	QN->Q (FR)	0.02368	0.75013	11.87020
	RN->Q (RR)	0.14360	1.02494	13.28430
	SN->Q (FR)	0.12744	1.09577	14.64300

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)	0.20250	1.04794	16.12610
	QN->Q (RF)	0.01778	0.59670	10.88280
	RN->Q (FF)	0.13466	1.07064	17.38560
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.20850	1.09246	13.57370
	QN->Q (RF)	0.01744	0.52541	8.31588
	RN->Q (FF)	0.14030	1.11464	14.82980

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)	0.18257	0.55701	6.44035
	RN->QN (FR)	0.11086	0.57481	7.70128
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.18827	0.62817	6.26570
	RN->QN (FR)	0.12015	0.65041	7.52426

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)	0.15234	0.51303	5.92956
	RN->QN (RF)	0.12149	0.49599	6.07636
	SN->QN (FF)	0.10473	0.56990	7.44685
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.14582	0.47614	4.23629
	RN->QN (RF)	0.11570	0.45978	4.37945
	SN->QN (FF)	0.09892	0.52901	5.74104

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)	-0.04171	-0.05386	-0.01084
	setup	CK (R)	0.13741	0.17231	0.43512
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.04171	-0.05386	-0.01150
	setup	CK (R)	0.13731	0.17245	0.42877

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)	-0.07867	-0.23145	-2.39487
	setup	CK (R)	0.10184	0.24230	3.32743
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07746	-0.23145	-2.43044
	setup	CK (R)	0.10184	0.24230	3.32832

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)	-0.04171	-0.05386	-0.01084
	setup	CK (R)	0.13741	0.17231	0.43512
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.04171	-0.05386	-0.01150
	setup	CK (R)	0.13731	0.17245	0.42877

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)	-0.07867	-0.23145	-2.39487
	setup	CK (R)	0.10184	0.24230	3.32743
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.07746	-0.23145	-2.43044
	setup	CK (R)	0.10184	0.24230	3.32832

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)	0.10896	0.14107	0.78483
	removal	CK (R)	-0.01498	-0.01808	-0.07597
	hold	SN (R)	-0.10053	-0.20975	-0.97994
	setup	SN (R)	0.12108	0.25422	4.62006
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.10867	0.14128	0.77920
	removal	CK (R)	-0.01498	-0.01808	-0.07597
	hold	SN (R)	-0.09556	-0.19890	-0.93208
	setup	SN (R)	0.12123	0.24627	4.39514

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)	0.10896	0.14107	0.78483
	removal	CK (R)	-0.01498	-0.01808	-0.07597
	hold	SN (R)	-0.10203	-0.20975	-0.97994
	hold	SN (R)	-0.10053	-0.20975	-0.98102
	setup	SN (R)	0.12108	0.25422	4.26021
	setup	SN (R)	0.12036	0.25228	4.62006
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.10867	0.14128	0.77920
	removal	CK (R)	-0.01498	-0.01808	-0.07597
	hold	SN (R)	-0.09556	-0.19890	-0.93208
	hold	SN (R)	-0.09608	-0.19890	-0.93900
	setup	SN (R)	0.12123	0.24415	4.01611
	setup	SN (R)	0.11626	0.24627	4.39514

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 ()	0.08857	0.42602	13.33370
	min_pulse_width	RN ()	0.08857	0.42602	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.08857	0.42602	13.33370
	min_pulse_width	RN ()	0.08535	0.42602	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)	0.02903	0.05786	4.57175
	removal	CK (R)	-0.01406	-0.04340	-0.24879
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.02730	0.05786	4.55744
	removal	CK (R)	-0.01406	-0.04340	-0.24770

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)	0.02903	0.05786	4.57175
	removal	CK (R)	-0.01406	-0.04340	-0.24879
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.02730	0.05786	4.55744
	removal	CK (R)	-0.01406	-0.04340	-0.24770

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 ()	0.10142	0.42602	13.33370
	min_pulse_width	SN ()	0.10142	0.42602	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.10142	0.42602	13.33370
	min_pulse_width	SN ()	0.09821	0.42602	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 ()	0.07893	0.42602	13.33370
	min_pulse_width	CK ()	0.10464	0.42602	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.07571	0.42602	13.33370
	min_pulse_width	CK ()	0.10142	0.42602	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 ()	0.17534	0.42602	13.33370
	min_pulse_width	CK ()	0.08535	0.42602	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.17534	0.42602	13.33370
	min_pulse_width	CK ()	0.08535	0.42602	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	0.01502	0.01366	0.00753
	RN	0.02758	0.02476	0.00436
	SN	-0.00152	-0.13876	-2.81405
	SN	0.02640	0.02255	-0.00973
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01376	0.01458	0.06486
	RN	0.02631	0.02559	0.06013
	SN	-0.00152	-0.09928	-1.61065
	SN	0.02513	0.02344	0.04455

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	0.01585	0.01459	0.02077
	RN	-0.00152	-0.13876	-2.81404
	RN	0.03271	0.03230	0.04637
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01450	0.01401	0.04772
	RN	-0.00152	-0.09928	-1.61065
	RN	0.03134	0.03176	0.07253

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	0.01584	0.01460	0.02211
	RN	-0.00152	-0.13833	-2.79919
	RN	0.03270	0.03229	0.04661
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01450	0.01401	0.04839
	RN	-0.00152	-0.09956	-1.61829
	RN	0.03134	0.03172	0.07244

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	0.01498	0.01369	0.00796
	RN	0.02754	0.02471	0.00349
	SN	-0.00152	-0.13833	-2.79945
	SN	0.02636	0.02255	-0.00971
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01371	0.01454	0.06329
	RN	0.02626	0.02554	0.05914
	SN	-0.00152	-0.09956	-1.61825
	SN	0.02509	0.02340	0.04560

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	-0.00374	-0.00385	-0.00384
	(!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)	0.01956	0.02101	0.10357
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00707	0.00872	0.08990
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00708	0.00874	0.08993
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00714	0.00877	0.08997
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00375	-0.00385	-0.00384
	(!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)	0.01956	0.02101	0.10357
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00707	0.00871	0.08990
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00708	0.00874	0.08994
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00714	0.00877	0.08997

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	0.00385	0.00386	0.00384
	(!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)	0.02756	0.02956	0.11295
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01240	0.01465	0.09618
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01250	0.01466	0.09611
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01233	0.01459	0.09611
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00385	0.00386	0.00384
	(!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)	0.02755	0.02955	0.11294
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01238	0.01462	0.09617
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01249	0.01465	0.09610
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01232	0.01458	0.09610

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)	0.00346	0.00796	0.14813
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01621	0.02051	0.16984
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)	0.00346	0.00797	0.14814
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01622	0.02051	0.16984

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)	0.01267	0.01912	0.15948
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02548	0.03140	0.18013
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)	0.01265	0.01910	0.15946
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02546	0.03138	0.18011

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)	-0.00896	-0.00899	-0.00901
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00857	-0.00955	-0.00951
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00852	-0.00903	-0.00901
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00565	0.00767	0.09345
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)	-0.00896	-0.00899	-0.00901
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00855	-0.00953	-0.00949
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00851	-0.00903	-0.00900
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00566	0.00766	0.09346

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)	0.00898	0.00919	0.00904
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00948	0.00955	0.00953
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00899	0.00906	0.00903
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02011	0.02151	0.10526
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)	0.00899	0.00919	0.00904
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00946	0.00953	0.00951
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00898	0.00906	0.00902
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.02009	0.02150	0.10526

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)	-0.00113	0.00326	0.14399
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00859	0.01198	0.16142
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00843	0.01181	0.16136
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00128	0.00311	0.14336
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00455	0.01264	0.26668
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00113	0.00326	0.14398
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00858	0.01196	0.16144
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00841	0.01179	0.16135
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00128	0.00311	0.14336
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00455	0.01265	0.26669

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)	0.04244	0.04776	0.22760
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01754	0.02446	0.16482
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02905	0.03448	0.18222
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02910	0.03474	0.18223
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03995	0.05194	0.27697
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01939	0.02558	0.16547
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02346	0.03583	0.28873
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04244	0.04776	0.22761
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01753	0.02447	0.16482
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02905	0.03448	0.18222
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02910	0.03475	0.18224
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03994	0.05193	0.27696
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01939	0.02558	0.16547
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02345	0.03582	0.28872

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00380	0.00674	0.01124	2.54650	2.56128
sky130_osu_sc_15T_ms__dffs_l	0.00380	0.00674	0.01124	1.72218	1.69944

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.19114	0.31507
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.18347	0.30740

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)	0.14595	0.95226	14.32810
	QN->Q (FR)	0.02164	0.70747	12.36540
	SN->Q (FR)	0.11676	1.07356	16.29520
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.14270	1.01202	13.31550
	QN->Q (FR)	0.02361	0.75275	11.96270
	SN->Q (FR)	0.11357	1.12792	15.26310

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)	0.18658	1.00426	14.66200
	QN->Q (RF)	0.01793	0.56197	9.78666
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.18839	1.07738	13.74360
	QN->Q (RF)	0.01739	0.52665	8.37725

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)	0.16646	0.54810	6.23589
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.16817	0.60486	6.20989

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)	0.12163	0.45079	5.06274
	SN->QN (FF)	0.09237	0.57103	7.02457
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.11463	0.43863	4.19418
	SN->QN (FF)	0.08513	0.55271	6.13296

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)	-0.03149	-0.04340	-0.00281
	setup	CK (R)	0.11351	0.14959	0.34974
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.03143	-0.04340	-0.00281
	setup	CK (R)	0.11480	0.15020	0.35269

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)	-0.06744	-0.21698	-2.38763
	setup	CK (R)	0.08811	0.22783	3.24781
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06524	-0.21698	-2.45027
	setup	CK (R)	0.08809	0.22783	3.24789

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)	-0.03149	-0.04340	-0.00281
	setup	CK (R)	0.11351	0.14959	0.34974
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.03143	-0.04340	-0.00281
	setup	CK (R)	0.11480	0.15020	0.35269

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)	-0.06744	-0.21698	-2.38763
	setup	CK (R)	0.08811	0.22783	3.24781
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.06524	-0.21698	-2.45027
	setup	CK (R)	0.08809	0.22783	3.24789

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)	0.02215	0.03493	2.74635
	removal	CK (R)	-0.01048	-0.02170	0.27602
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.02525	0.03674	2.61867
	removal	CK (R)	-0.01048	-0.02170	0.27602

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)	0.02215	0.03493	2.74635
	removal	CK (R)	-0.01048	-0.02170	0.27602
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.02525	0.03674	2.61867
	removal	CK (R)	-0.01048	-0.02170	0.27602

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 ()	0.08535	0.42602	13.33370
	min_pulse_width	SN ()	0.08857	0.42602	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.08535	0.42602	13.33370
	min_pulse_width	SN ()	0.08535	0.42602	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 ()	0.06286	0.42602	13.33370
	min_pulse_width	CK ()	0.09178	0.42602	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.05964	0.42602	13.33370
	min_pulse_width	CK ()	0.08857	0.42602	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 ()	0.14963	0.42602	13.33370
	min_pulse_width	CK ()	0.07250	0.42602	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.14963	0.42602	13.33370
	min_pulse_width	CK ()	0.07250	0.42602	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	0.01184	0.01130	0.02593
	SN	-0.00152	-0.12677	-2.42077
	SN	0.02189	0.02041	0.01639
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01041	0.01136	0.06232
	SN	-0.00152	-0.10025	-1.63714
	SN	0.02047	0.02049	0.05305

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	0.01357	0.01066	-0.00551
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01217	0.01164	0.04614

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	0.01356	0.01064	-0.00589
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01216	0.01166	0.04716

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	0.01180	0.01139	0.02422
	SN	-0.00152	-0.12721	-2.43469
	SN	0.02186	0.02038	0.01518
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01036	0.01137	0.06186
	SN	-0.00152	-0.09946	-1.61549
	SN	0.02043	0.02049	0.05280

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	-0.00381	-0.00391	-0.00390
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01464	0.01630	0.10120
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00608	0.00781	0.08949
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00381	-0.00391	-0.00390
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01464	0.01630	0.10120
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00608	0.00781	0.08949

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	0.00391	0.00392	0.00390
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02354	0.02567	0.10993
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01181	0.01416	0.09626
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00391	0.00392	0.00390
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02353	0.02567	0.10993
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01181	0.01416	0.09626

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)	-0.00646	-0.00650	-0.00649
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00478	0.00674	0.09419
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)	-0.00646	-0.00649	-0.00649
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00478	0.00674	0.09419

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)	0.00651	0.00653	0.00651
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01390	0.01692	0.10466
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)	0.00651	0.00653	0.00651
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01390	0.01692	0.10466

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)	-0.00117	0.00325	0.14410
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00146	0.00295	0.14333
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00350	0.01195	0.26713
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00117	0.00325	0.14410
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00146	0.00295	0.14333
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00350	0.01195	0.26713

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)	0.03752	0.04279	0.22412
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01748	0.02443	0.16492
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03582	0.04810	0.27137
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01949	0.02569	0.16570
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02275	0.03542	0.28927
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03751	0.04279	0.22412
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01748	0.02442	0.16492
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03582	0.04809	0.27137
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01948	0.02569	0.16570
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02275	0.03542	0.28927

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00396	0.01103	2.98208	2.96279
sky130_osu_sc_15T_ms__dff_l	0.00396	0.01102	1.50011	1.49194

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.17740	0.23085
sky130_osu_sc_15T_ms__dff_l	0.00000	0.16972	0.22318

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)	0.11844	0.95778	15.93490
	QN->Q (FR)	0.01849	0.65050	11.80690
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.12245	0.96169	12.10420
	QN->Q (FR)	0.02718	0.81431	12.48320

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)	0.16778	1.01099	16.17240
	QN->Q (RF)	0.01770	0.59608	10.90320
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.17659	1.04214	12.65380
	QN->Q (RF)	0.01753	0.50217	7.70469

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)	0.14826	0.51862	6.41816
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.15660	0.60241	6.04030

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)	0.09732	0.44816	5.84897
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.09445	0.39275	3.55736

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)	-0.02742	-0.03616	0.00991
	setup	CK (R)	0.08027	0.12450	0.33739
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.02629	-0.03816	0.01047
	setup	CK (R)	0.08236	0.12591	0.33824

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)	-0.06085	-0.22060	-2.79973
	setup	CK (R)	0.07997	0.22783	3.28408
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.06305	-0.22060	-2.84063
	setup	CK (R)	0.07756	0.22783	3.28458

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 ()	0.05000	0.42602	13.33370
	min_pulse_width	CK ()	0.08857	0.42602	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.05000	0.42602	13.33370
	min_pulse_width	CK ()	0.08535	0.42602	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 ()**	0.11749	0.42602	13.33370
	min_pulse_width	**CK ()**	0.05964	0.42602	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.11749	0.42602	13.33370
	min_pulse_width	**CK ()**	0.05964	0.42602	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	0.01244	0.01125	0.00790
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01123	0.01241	0.07055

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	0.01377	0.01265	0.02098
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01241	0.01100	0.03341

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	0.01376	0.01267	0.02248
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01241	0.01098	0.03425

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	0.01240	0.01134	0.00871
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01118	0.01242	0.06943

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	-0.00322	-0.00380	-0.00383
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01332	0.01536	0.10134
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00322	-0.00380	-0.00383
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01333	0.01537	0.10135

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	0.00381	0.00384	0.00383
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02417	0.02656	0.11110
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00381	0.00384	0.00383
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02418	0.02657	0.11111

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)	-0.00117	0.00328	0.14411
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00145	0.00298	0.14335
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00117	0.00328	0.14411
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00145	0.00298	0.14335

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)	0.01738	0.02440	0.16482
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03624	0.04183	0.22425
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03632	0.04898	0.27706
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01937	0.02558	0.16557
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01738	0.02450	0.16482
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03625	0.04183	0.22424
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03633	0.04896	0.27708
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01937	0.02558	0.16557

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

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	0.00384	2.68965
sky130_osu_sc_15T_ms__inv_10	0.03533	23.33818
sky130_osu_sc_15T_ms__inv_2	0.00725	5.20493
sky130_osu_sc_15T_ms__inv_3	0.01079	7.45065
sky130_osu_sc_15T_ms__inv_4	0.01425	10.00209
sky130_osu_sc_15T_ms__inv_6	0.02135	14.69991
sky130_osu_sc_15T_ms__inv_8	0.02834	19.37627
sky130_osu_sc_15T_ms__inv_l	0.00290	1.42566

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.02884	0.05758
sky130_osu_sc_15T_ms__inv_10	0.00000	0.28836	0.57582
sky130_osu_sc_15T_ms__inv_2	0.00000	0.05767	0.11516
sky130_osu_sc_15T_ms__inv_3	0.00000	0.08651	0.17275
sky130_osu_sc_15T_ms__inv_4	0.00000	0.11534	0.23033
sky130_osu_sc_15T_ms__inv_6	0.00000	0.17301	0.34549
sky130_osu_sc_15T_ms__inv_8	0.00000	0.23068	0.46066
sky130_osu_sc_15T_ms__inv_l	0.00000	0.02500	0.04984

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)**	0.01742	0.57939	10.20260
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.02809	0.37987	9.99772
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01458	0.49601	10.02300
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.01640	0.46417	10.06840
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.01702	0.43653	10.01980
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.01984	0.40682	10.02620
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02365	0.38997	10.05090
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.02287	0.66548	10.07350

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)**	0.01546	0.49129	8.72720
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.02529	0.28808	8.49217
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01305	0.40986	8.61588
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01463	0.38035	8.71787
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01478	0.35136	8.68206
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.01834	0.32128	8.67834
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02162	0.30349	8.67344
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.01573	0.43043	6.47027

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	0.00601	0.00877	0.03385
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05285	0.08506	0.32055
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01059	0.01662	0.06423
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01629	0.02541	0.09582
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02092	0.03228	0.12667
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03115	0.05088	0.18964
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04164	0.06977	0.25309
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00449	0.00643	0.02788

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	-0.00141	-0.00045	0.00986
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01770	-0.00431	0.09460
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00420	-0.00186	0.01871
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00558	-0.00220	0.02828
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00833	-0.00344	0.03716
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01263	-0.00380	0.05594
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01613	-0.00556	0.07518
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00086	-0.00020	0.00968

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.10708	0.10694	0.00785	0.10146

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.05923	0.06353

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)	-	0.00848	0.07211	0.37146
	A1->Y (RR)	-	0.00925	0.07272	0.37044
	S0->Y (RR)	(!A0 * A1)	0.03086	0.10539	-0.04765
	S0->Y (FR)	(A0 * !A1)	0.02369	0.19223	1.68040

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)	-	0.00847	0.08314	0.42936
	A1->Y (FF)	-	0.00833	0.08240	0.42773
	S0->Y (FF)	(!A0 * A1)	0.03690	0.18817	1.27165
	S0->Y (RF)	(A0 * !A1)	0.01834	0.11197	0.35794

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	-	-0.00625	-0.00626	-0.00628
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00404	-0.00404	-0.00405
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00757	0.01473	0.15503
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00425	0.00112	0.14096

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	-	0.00625	0.00626	0.00628
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00404	0.00404	0.00405
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00092	0.00696	0.14755
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01659	0.02307	0.16267

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)	-0.00145	-0.00145	-0.00145

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)	0.00145	0.00145	0.00145

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)	-0.00175	-0.00175	-0.00175

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)	0.00175	0.00175	0.00175

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)	-0.00170	0.00415	0.14416
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00165	0.00408	0.14430

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)	0.01261	0.01922	0.15906
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01153	0.01852	0.15881

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00384	0.00381	2.46144
sky130_osu_sc_15T_ms__nand2_l	0.00290	0.00290	1.41045

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.02887	0.11516
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.02503	0.09969

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)	0.01781	0.56643	9.74057
	B->Y (FR)	0.02124	0.55951	9.53864
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.02334	0.66519	10.04540
	B->Y (FR)	0.02870	0.66871	10.01370

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)	0.02031	0.56613	9.94544
	B->Y (RF)	0.02367	0.56697	9.86937
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.02037	0.51213	7.66368
	B->Y (RF)	0.02334	0.50884	7.53869

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	0.00640	0.00904	0.03177
	B	0.00000	0.00000	0.00000
	B	0.00832	0.01064	0.03413
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00474	0.00656	0.02519
	B	0.00000	0.00000	0.00000
	B	0.00617	0.00762	0.02700

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	-0.00102	0.00017	0.00922
	B	0.00000	0.00000	0.00000
	B	-0.00098	-0.00065	0.00677
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00063	-0.00012	0.00866
	B	0.00000	0.00000	0.00000
	B	-0.00061	-0.00034	0.00689

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)	-0.00442	-0.00444	-0.00445
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00306	-0.00307	-0.00308

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)	0.00444	0.00454	0.00446
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00307	0.00312	0.00309

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)	-0.00405	-0.00408	-0.00407
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00281	-0.00283	-0.00282

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)	0.00409	0.00412	0.00408
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00285	0.00285	0.00282

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00382	0.00410	1.55621
sky130_osu_sc_15T_ms__nor2_l	0.00281	0.00312	0.93074

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.01928	0.05758
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.01866	0.04984

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)	0.03422	0.65616	9.94827
	B->Y (FR)	0.02582	0.65574	10.08800
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.04178	0.76353	10.08650
	B->Y (FR)	0.03424	0.76959	10.33870

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)	0.02148	0.40817	6.13434
	B->Y (RF)	0.01659	0.39978	6.11703
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.01990	0.36823	4.75160
	B->Y (RF)	0.01668	0.36207	4.73711

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	0.00880	0.00939	0.02601
	B	0.00000	0.00000	0.00000
	B	0.00661	0.00906	0.03913
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00620	0.00658	0.02072
	B	0.00000	0.00000	0.00000
	B	0.00488	0.00644	0.02995

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	0.00083	0.00140	0.01518
	B	0.00000	0.00000	0.00000
	B	-0.00108	-0.00014	0.01300
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00048	0.00098	0.01339
	B	0.00000	0.00000	0.00000
	B	-0.00061	0.00005	0.01184

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)	-0.00324	-0.00387	-0.00386
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00220	-0.00257	-0.00256

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)	0.00384	0.00390	0.00386
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00254	0.00258	0.00256

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)	-0.00177	-0.00181	-0.00178
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00119	-0.00121	-0.00119

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)	0.00184	0.00185	0.00179
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00124	0.00125	0.00121

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00384	0.00393	0.00329	1.46639

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.02838	0.10743

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)	0.03640	0.66819	9.97203
	A1->Y (FR)	0.04766	0.67423	9.86244
	B0->Y (FR)	0.02742	0.63838	9.63960

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)	0.02906	0.48062	7.08410
	A1->Y (RF)	0.03427	0.47365	6.87691
	B0->Y (RF)	0.02222	0.50890	7.67934

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	0.00928	0.01085	0.03634
	A1	0.00000	0.00000	0.00000
	A1	0.01148	0.01188	0.02740
	B0	0.00532	0.00670	0.02269

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	0.00009	0.00035	0.00980
	A1	0.00000	0.00000	0.00000
	A1	0.00203	0.00207	0.01176
	B0	0.00074	0.00124	0.00906

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)	-0.00177	-0.00180	-0.00178
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00381	-0.00390	-0.00390
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00394	-0.00395	-0.00395

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)	0.00185	0.00186	0.00180
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00388	0.00390	0.00390
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00394	0.00397	0.00396

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)	-0.00315	-0.00375	-0.00377
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00377	-0.00385	-0.00386
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00389	-0.00391	-0.00389

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)	0.00375	0.00375	0.00377
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00384	0.00385	0.00386
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00389	0.00393	0.00390

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)	-0.00317	-0.00318	-0.00321

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)	0.00321	0.00328	0.00323

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00372	0.00393	0.00406	0.00396	1.52431

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.02895	0.11516

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)	0.04820	0.66922	9.84759
	A1->Y (FR)	0.04249	0.66828	9.99470
	B0->Y (FR)	0.02818	0.65515	9.99272
	B1->Y (FR)	0.03740	0.65728	9.85374

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)	0.04923	0.51561	7.35526
	A1->Y (RF)	0.03953	0.50109	7.29034
	B0->Y (RF)	0.03310	0.52919	7.89878
	B1->Y (RF)	0.04327	0.54789	8.03134

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	0.01494	0.01529	0.02947
	A1	0.01162	0.01362	0.04165
	B0	0.00699	0.00917	0.03683
	B1	0.00937	0.00983	0.02464

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00133	0.00136	0.01104
	A1	-0.00048	-0.00023	0.00927
	B0	-0.00050	0.00026	0.01235
	B1	0.00135	0.00179	0.01345

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)	-0.00323	-0.00387	-0.00386
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00323	-0.00387	-0.00386
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00377	-0.00386	-0.00387
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00390	-0.00392	-0.00390

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)	0.00384	0.00390	0.00386
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00385	0.00390	0.00386
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00384	0.00391	0.00387
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00390	0.00392	0.00391

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)	-0.00175	-0.00179	-0.00176
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00175	-0.00179	-0.00176
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00374	-0.00383	-0.00382
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00387	-0.00390	-0.00387

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)	0.00182	0.00184	0.00178
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00182	0.00184	0.00178
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00380	0.00385	0.00382
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00387	0.00390	0.00388

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)	-0.00173	-0.00178	-0.00174
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00173	-0.00178	-0.00174
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00425	-0.00436	-0.00434
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00430	-0.00432	-0.00437

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)	0.00180	0.00182	0.00176
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00180	0.00182	0.00176
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00437	0.00439	0.00434
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00436	0.00446	0.00439

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)	-0.00318	-0.00379	-0.00378
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00318	-0.00377	-0.00378
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00435	-0.00447	-0.00444
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00440	-0.00441	-0.00446

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)	0.00376	0.00382	0.00379
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00376	0.00377	0.00379
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00447	0.00454	0.00445
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00446	0.00456	0.00448

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00418	0.00394	2.79844
sky130_osu_sc_15T_ms__or2_2	0.00418	0.00394	5.42843
sky130_osu_sc_15T_ms__or2_4	0.00418	0.00394	10.49925
sky130_osu_sc_15T_ms__or2_8	0.00418	0.00396	19.80367
sky130_osu_sc_15T_ms__or2_l	0.00322	0.00296	1.49003

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.03374	0.05776
sky130_osu_sc_15T_ms__or2_2	0.00000	0.04820	0.11534
sky130_osu_sc_15T_ms__or2_4	0.00000	0.07713	0.23051
sky130_osu_sc_15T_ms__or2_8	0.00000	0.13498	0.46083
sky130_osu_sc_15T_ms__or2_l	0.00000	0.03124	0.05016

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)	0.04539	0.41292	6.10071
	B->Y (RR)	0.03920	0.39502	6.10829
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.05044	0.35921	6.04974
	B->Y (RR)	0.04405	0.34183	6.02888
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.06599	0.35526	6.29520
	B->Y (RR)	0.05962	0.34041	6.25864
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.09666	0.39239	6.51206
	B->Y (RR)	0.09037	0.38082	6.46686
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.04843	0.46126	5.31307
	B->Y (RR)	0.04327	0.44407	5.26932

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)	0.06428	0.49377	7.08179
	B->Y (FF)	0.05270	0.48410	7.33507
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.07455	0.45851	7.09988
	B->Y (FF)	0.06306	0.45177	7.32010
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.10376	0.47580	7.37585
	B->Y (FF)	0.09232	0.47439	7.54839
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.16514	0.54146	7.46876
	B->Y (FF)	0.15374	0.54561	7.58648
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.07483	0.49483	5.70504
	B->Y (FF)	0.06192	0.49067	5.95364

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	0.00638	0.00810	0.06532
	B	0.00000	0.00000	0.00000
	B	0.00471	0.00832	0.08832
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01119	0.01333	0.07329
	B	0.00000	0.00000	0.00000
	B	0.00936	0.01311	0.09386
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02185	0.02419	0.08465
	B	0.00000	0.00000	0.00000
	B	0.01998	0.02429	0.10436
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04664	0.04763	0.10792
	B	0.00000	0.00000	0.00000
	B	0.04474	0.04825	0.12521
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00460	0.00594	0.04248
	B	0.00000	0.00000	0.00000
	B	0.00356	0.00583	0.05121

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	0.01463	0.01667	0.07424
	B	0.00000	0.00000	0.00000
	B	0.01208	0.01745	0.12933
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01854	0.02043	0.07878
	B	0.00000	0.00000	0.00000
	B	0.01595	0.02116	0.13135
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.03043	0.02978	0.08756
	B	0.00000	0.00000	0.00000
	B	0.02793	0.03039	0.13576
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.06318	0.05039	0.10593
	B	0.00000	0.00000	0.00000
	B	0.06063	0.05112	0.14706
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.01080	0.01195	0.05471
	B	0.00000	0.00000	0.00000
	B	0.00910	0.01244	0.08497

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)	-0.00328	-0.00386	-0.00389
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00329	-0.00386	-0.00388
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00329	-0.00386	-0.00389
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00329	-0.00386	-0.00389
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00221	-0.00258	-0.00259

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)	0.00386	0.00392	0.00389
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00386	0.00391	0.00388
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00386	0.00392	0.00389
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00386	0.00392	0.00389
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00257	0.00261	0.00259

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)	-0.00177	-0.00180	-0.00178
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00177	-0.00180	-0.00178
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00177	-0.00180	-0.00178
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00177	-0.00180	-0.00178
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00123	-0.00124	-0.00122

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)	0.00185	0.00187	0.00180
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00185	0.00187	0.00180
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00185	0.00187	0.00180
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00185	0.00187	0.00180
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00127	0.00128	0.00124

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00408	0.00532	1.56988
sky130_osu_sc_15T_ms__tbufi_l	0.00313	0.00413	0.91529

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.02890	0.11516
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.02512	0.09969

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)	0.02452	0.65099	10.05120
	OE->Y (FR)	0.03070	0.34028	5.34280
	OE->Y (RR)	0.04779	0.47830	6.30680
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.03293	0.76334	10.22540
	OE->Y (FR)	0.03560	0.34013	5.34263
	OE->Y (RR)	0.05351	0.54585	5.73919

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)	0.01986	0.47827	7.35667
	OE->Y (FF)	0.03101	0.34028	5.34280
	OE->Y (RF)	0.02009	0.47226	7.21801
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.02019	0.42922	5.63717
	OE->Y (FF)	0.03578	0.34012	5.34261
	OE->Y (RF)	0.02013	0.42247	5.50749

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	0.00614	0.00832	0.03444
	OE	0.00000	0.00000	0.00000
	OE	0.00609	0.01126	0.12751
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00455	0.00593	0.02696
	OE	0.00000	0.00000	0.00000
	OE	0.00428	0.00793	0.08988

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	-0.00110	-0.00025	0.01114
	OE	0.00000	0.00000	0.00000
	OE	0.00376	0.00957	0.14756
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00062	0.00007	0.01038
	OE	0.00000	0.00000	0.00000
	OE	0.00255	0.00668	0.10487

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)	-0.00307	-0.00310	-0.00308
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00269	-0.00273	-0.00270
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00224	-0.00226	-0.00225
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00200	-0.00202	-0.00201

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)	0.00307	0.00310	0.00308
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00274	0.00277	0.00272
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00224	0.00226	0.00225
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00203	0.00205	0.00201

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)	0.00222	0.00857	0.15127
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00198	0.00823	0.15109
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00146	0.00600	0.10674
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00131	0.00576	0.10658

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)	0.00734	0.01490	0.15675
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00733	0.01504	0.15678
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00560	0.01071	0.11091
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00564	0.01081	0.11096

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00408	0.00617	1.57000
sky130_osu_sc_15T_ms__tnbufi_l	0.00312	0.00448	0.93043

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.04807	0.05767
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.04168	0.05000

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)	0.02464	0.65093	10.05140
	OE->Y (RR)	0.02089	0.34079	5.34329
	OE->Y (FR)	0.03249	0.65072	9.88544
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.03303	0.76850	10.33100
	OE->Y (RR)	0.01997	0.34073	5.34332
	OE->Y (FR)	0.04051	0.76268	10.04030

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)	0.01955	0.47819	7.35715
	OE->Y (RF)	0.02071	0.34080	5.34329
	OE->Y (FF)	0.03487	0.41210	5.49223
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.01979	0.43267	5.70551
	OE->Y (RF)	0.01988	0.34073	5.34323
	OE->Y (FF)	0.03893	0.42253	4.83367

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	0.00634	0.00850	0.03462
	OE	0.00000	0.00000	0.00000
	OE	0.01573	0.02340	0.16395
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00475	0.00613	0.02692
	OE	0.00000	0.00000	0.00000
	OE	0.01134	0.01656	0.11529

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	-0.00136	-0.00049	0.01091
	OE	0.00000	0.00000	0.00000
	OE	0.01367	0.02081	0.13440
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00087	-0.00027	0.01002
	OE	0.00000	0.00000	0.00000
	OE	0.00982	0.01482	0.09877

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)	-0.00256	-0.00259	-0.00258
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00222	-0.00226	-0.00223
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00177	-0.00178	-0.00177
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00154	-0.00156	-0.00155

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)	0.00256	0.00259	0.00258
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00226	0.00229	0.00225
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00177	0.00178	0.00177
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00157	0.00158	0.00155

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)	-0.00460	0.00160	0.14481
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00462	0.00165	0.14479
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00295	0.00140	0.10251
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00292	0.00141	0.10253

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)	0.01185	0.02028	0.16318
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01170	0.01987	0.16301
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00854	0.01426	0.11507
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00844	0.01403	0.11495

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00809	0.00719	1.61554

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.09476	0.17283

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	0.05987	0.50292	6.45889
	A->Y (FR)	!B	0.03195	0.65879	10.12630
	B->Y (RR)	A	0.04809	0.49306	6.57041
	B->Y (FR)	!A	0.04492	0.66435	10.01540

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	0.05806	0.45765	5.83390
	A->Y (RF)	!B	0.02777	0.48409	7.37625
	B->Y (FF)	A	0.05051	0.45173	5.84989
	B->Y (RF)	!A	0.03496	0.49254	7.36435

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	0.00621	0.01096	0.13057
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01536	0.02437	0.18696
	B	A	0.00000	0.00000	0.00000
	B	A	0.00211	0.00831	0.15376
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01680	0.02386	0.17248

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	0.01893	0.02480	0.16334
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00393	0.00969	0.15681
	B	A	0.00000	0.00000	0.00000
	B	A	0.01716	0.02434	0.16806
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00534	0.01103	0.15555

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_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	0.00813	0.00723	1.57280

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.09476	0.14791

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	0.05972	0.49975	6.51616
	A->Y (FR)	B	0.04150	0.66711	10.07190
	B->Y (RR)	!A	0.05136	0.49965	6.55614
	B->Y (FR)	A	0.04562	0.66920	10.02710

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	0.05287	0.45379	5.58131
	A->Y (RF)	B	0.02805	0.49093	7.35518
	B->Y (FF)	!A	0.04843	0.44936	5.75585
	B->Y (RF)	A	0.03533	0.49007	7.24535

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	0.01829	0.02556	0.17769
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00323	0.00730	0.14507
	B	A	0.00000	0.00000	0.00000
	B	A	0.01876	0.02587	0.17184
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00190	0.00773	0.15142

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	0.00316	0.00881	0.15891
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01968	0.02709	0.13912
	B	A	0.00000	0.00000	0.00000
	B	A	0.00324	0.00851	0.15069
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01749	0.02482	0.16703

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ff_1P95_-40C.ccs
Cell Library: Process , Voltage 1.95, Temp -40.00

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	0.97103
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	464756.00000	929512.00000
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
	-0.00122	0.12420	1.87788

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
	8.08808	7.72577	2.22913