sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_HS__ADDFx
SKY130_OSU_SC_15T_HS__ADDHx
SKY130_OSU_SC_15T_HS__AND2x
SKY130_OSU_SC_15T_HS__AOI21
SKY130_OSU_SC_15T_HS__AOI22
SKY130_OSU_SC_15T_HS__BUFx
SKY130_OSU_SC_15T_HS__DFFRx
SKY130_OSU_SC_15T_HS__DFFSRx
SKY130_OSU_SC_15T_HS__DFFSx
SKY130_OSU_SC_15T_HS__DFFx
SKY130_OSU_SC_15T_HS__INVx
SKY130_OSU_SC_15T_HS__MUX2
SKY130_OSU_SC_15T_HS__NAND2x
SKY130_OSU_SC_15T_HS__NOR2x
SKY130_OSU_SC_15T_HS__OAI21
SKY130_OSU_SC_15T_HS__OAI22
SKY130_OSU_SC_15T_HS__OR2x
SKY130_OSU_SC_15T_HS__TBUFIx
SKY130_OSU_SC_15T_HS__TNBUFIx
SKY130_OSU_SC_15T_HS__XNOR2
SKY130_OSU_SC_15T_HS__XOR2
SKY130_OSU_SC_15T_HS_x

SKY130_OSU_SC_15T_HS__ADDFx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__addf_1	39.07200
sky130_osu_sc_15T_hs__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_hs__addf_1	0.01357	0.01358	0.01063	2.03992	0.95143	1.93663
sky130_osu_sc_15T_hs__addf_l	0.01358	0.01357	0.01062	1.18160	0.95128	1.22699

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__addf_1	0.00000	0.03046	0.04112
sky130_osu_sc_15T_hs__addf_l	0.00000	0.03122	0.04188

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->CO (RR)	0.10887	1.42878	23.31370
	B->CO (RR)	0.10301	1.35782	22.13470
	CI->CO (RR)	0.10314	1.45024	23.77810
	CON->CO (FR)	0.02122	0.68628	11.41680
sky130_osu_sc_15T_hs__addf_l	A->CO (RR)	0.11677	1.32475	17.68150
	B->CO (RR)	0.11029	1.27252	17.14910
	CI->CO (RR)	0.11104	1.34866	18.23090
	CON->CO (FR)	0.02828	0.79009	11.56650

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->CO (FF)	0.15428	1.84780	29.82710
	B->CO (FF)	0.13767	1.76714	28.58660
	CI->CO (FF)	0.13284	1.81496	29.68150
	CON->CO (RF)	0.01666	0.48113	8.04204
sky130_osu_sc_15T_hs__addf_l	A->CO (FF)	0.15132	1.51292	20.10670
	B->CO (FF)	0.13478	1.45117	19.39730
	CI->CO (FF)	0.12984	1.48080	20.01080
	CON->CO (RF)	0.01693	0.44479	6.48019

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->CON (FR)	0.12802	0.91620	11.31220
	B->CON (FR)	0.11096	0.86611	10.90410
	CI->CON (FR)	0.10665	0.88487	11.23610
sky130_osu_sc_15T_hs__addf_l	A->CON (FR)	0.12131	0.90760	11.30510
	B->CON (FR)	0.10480	0.86016	10.89580
	CI->CON (FR)	0.09995	0.87858	11.22840

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->CON (RF)	0.06457	0.48473	5.91657
	B->CON (RF)	0.06092	0.48165	5.94020
	CI->CON (RF)	0.05886	0.51134	6.44736
sky130_osu_sc_15T_hs__addf_l	A->CON (RF)	0.06225	0.48227	5.91325
	B->CON (RF)	0.05878	0.47943	5.93768
	CI->CON (RF)	0.05653	0.50894	6.44400

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->S (-R)	0.22794	1.69937	24.16540
	B->S (-R)	0.23051	1.68001	23.31320
	CI->S (-R)	0.20484	1.66292	24.02530
	CON->S (RR)	0.06420	0.53285	6.62653
sky130_osu_sc_15T_hs__addf_l	A->S (-R)	0.22376	1.57758	19.48540
	B->S (-R)	0.22671	1.57093	18.99740
	CI->S (-R)	0.20067	1.54254	19.38010
	CON->S (RR)	0.06869	0.61126	6.68493

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addf_1	A->S (-F)	0.17601	1.23474	16.59260
	B->S (-F)	0.17591	1.18427	15.91580
	CI->S (-F)	0.16989	1.25350	17.06810
	CON->S (FF)	0.07357	0.58553	6.91738
sky130_osu_sc_15T_hs__addf_l	A->S (-F)	0.16605	1.04977	11.99870
	B->S (-F)	0.16088	1.00050	11.70470
	CI->S (-F)	0.15984	1.07082	12.53750
	CON->S (FF)	0.06984	0.54466	5.67713

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.00211	0.00242	0.01121
	B	0.00237	0.00267	0.01021
	CI	0.00321	0.00359	0.01253
sky130_osu_sc_15T_hs__addf_l	A	0.00164	0.00178	0.00674
	B	0.00191	0.00203	0.00650
	CI	0.00274	0.00294	0.00824

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.00835	0.00894	0.02652
	B	0.00878	0.00921	0.02465
	CI	0.00703	0.00767	0.02582
sky130_osu_sc_15T_hs__addf_l	A	0.00790	0.00822	0.01772
	B	0.00833	0.00857	0.01665
	CI	0.00658	0.00699	0.01729

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.00834	0.00860	0.01631
	B	0.00856	0.00878	0.01587
	CI	0.00702	0.00736	0.01608
sky130_osu_sc_15T_hs__addf_l	A	0.00789	0.00807	0.01567
	B	0.00812	0.00831	0.01524
	CI	0.00658	0.00690	0.01540

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.00210	0.00228	0.00655
	B	0.00236	0.00252	0.00637
	CI	0.00320	0.00344	0.00828
sky130_osu_sc_15T_hs__addf_l	A	0.00164	0.00175	0.00580
	B	0.00190	0.00198	0.00561
	CI	0.00273	0.00291	0.00750

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.00835	0.00889	0.02550
	B	0.00878	0.00919	0.02374
	CI	0.00703	0.00764	0.02479
sky130_osu_sc_15T_hs__addf_l	A	0.00790	0.00823	0.01815
	B	0.00833	0.00858	0.01700
	CI	0.00658	0.00700	0.01771

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addf_1	A	0.01829	0.01831	0.02626
	B	0.01639	0.01662	0.03432
	CI	0.01491	0.01486	0.02357
sky130_osu_sc_15T_hs__addf_l	A	0.01767	0.01760	0.02574
	B	0.01579	0.01603	0.03441
	CI	0.01430	0.01422	0.02343

SKY130_OSU_SC_15T_HS__ADDHx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__addh_1	23.19900
sky130_osu_sc_15T_hs__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_hs__addh_1	0.00692	0.00767	1.98821	1.02177	2.04126
sky130_osu_sc_15T_hs__addh_l	0.00703	0.00790	1.24486	1.02471	1.25899

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__addh_1	0.00000	0.03413	0.03983
sky130_osu_sc_15T_hs__addh_l	0.00000	0.03548	0.04091

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->CO (RR)	0.07744	0.52944	6.22873
	B->CO (RR)	0.07996	0.53159	6.32539
sky130_osu_sc_15T_hs__addh_l	A->CO (RR)	0.06958	0.58139	6.17646
	B->CO (RR)	0.07214	0.58461	6.23657

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->CO (FF)	0.06265	0.50048	5.70271
	B->CO (FF)	0.06667	0.51028	5.68981
sky130_osu_sc_15T_hs__addh_l	A->CO (FF)	0.06064	0.48534	4.97088
	B->CO (FF)	0.06572	0.49860	4.97659

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->CON (RR)	B	0.10992	0.42249	2.92122
	A->CON (FR)	!B	0.07144	0.82331	11.05170
	B->CON (RR)	A	0.11226	0.42444	3.01834
	B->CON (FR)	!A	0.08745	0.85583	11.24530
sky130_osu_sc_15T_hs__addh_l	A->CON (RR)	B	0.08807	0.38455	2.80292
	A->CON (FR)	!B	0.06542	0.81786	11.06480
	B->CON (RR)	A	0.09059	0.38753	2.86561
	B->CON (FR)	!A	0.08134	0.85053	11.25990

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->CON (FF)	B	0.08955	0.50717	4.70436
	A->CON (RF)	!B	0.03077	0.41905	5.60315
	B->CON (FF)	A	0.09000	0.52951	4.92467
	B->CON (RF)	!A	0.03518	0.40472	5.26906
sky130_osu_sc_15T_hs__addh_l	A->CON (FF)	B	0.08401	0.49434	4.66908
	A->CON (RF)	!B	0.02929	0.41733	5.61108
	B->CON (FF)	A	0.08585	0.52046	4.90083
	B->CON (RF)	!A	0.03371	0.40313	5.27720

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->S (RR)	!B	0.06612	1.21198	20.26620
	A->S (FR)	B	0.12541	1.27385	18.71430
	B->S (RR)	!A	0.07025	1.16338	19.27910
	B->S (FR)	A	0.12698	1.33313	19.64540
	CON->S (FR)	-	0.02348	0.70329	11.68710
sky130_osu_sc_15T_hs__addh_l	A->S (RR)	!B	0.07049	1.15622	16.44440
	A->S (FR)	B	0.12583	1.21441	15.01300
	B->S (RR)	!A	0.07465	1.11956	15.77620
	B->S (FR)	A	0.12875	1.26735	15.63910
	CON->S (FR)	-	0.02869	0.79767	11.85050

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__addh_1	A->S (FF)	!B	0.09700	1.67679	27.96580
	A->S (RF)	B	0.13415	1.05925	14.95420
	B->S (FF)	!A	0.11305	1.71173	28.22030
	B->S (RF)	A	0.13650	1.06002	15.05220
	CON->S (RF)	-	0.01621	0.48317	8.09670
sky130_osu_sc_15T_hs__addh_l	A->S (FF)	!B	0.09202	1.39191	19.73080
	A->S (RF)	B	0.11231	0.83996	9.48563
	B->S (FF)	!A	0.10810	1.42480	19.94410
	B->S (RF)	A	0.11480	0.84207	9.54031
	CON->S (RF)	-	0.01582	0.44699	6.64235

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	0.00000	0.00000	0.00000
	A	0.00422	0.00416	0.00973
	B	0.00000	0.00000	0.00000
	B	0.00387	0.00366	0.01001
sky130_osu_sc_15T_hs__addh_l	A	0.00000	0.00000	0.00000
	A	0.00372	0.00354	0.01039
	B	0.00000	0.00000	0.00000
	B	0.00338	0.00313	0.01049

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	0.00000	0.00000	0.00000
	A	0.00623	0.00622	0.01395
	B	0.00000	0.00000	0.00000
	B	0.00645	0.00672	0.01444
sky130_osu_sc_15T_hs__addh_l	A	0.00000	0.00000	0.00000
	A	0.00577	0.00580	0.01394
	B	0.00000	0.00000	0.00000
	B	0.00609	0.00636	0.01436

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00422	0.00410	0.00994
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00548	0.00561	0.00827
	B	A	0.00000	0.00000	0.00000
	B	A	0.00387	0.00367	0.01035
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00610	0.00603	0.00706
sky130_osu_sc_15T_hs__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00372	0.00353	0.01026
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00520	0.00528	0.00753
	B	A	0.00000	0.00000	0.00000
	B	A	0.00337	0.00312	0.01036
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00580	0.00569	0.00638

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00623	0.00624	0.01417
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00083	0.00088	0.00164
	B	A	0.00000	0.00000	0.00000
	B	A	0.00645	0.00670	0.01456
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00146	0.00140	0.00242
sky130_osu_sc_15T_hs__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00577	0.00580	0.01398
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00040	0.00042	0.00099
	B	A	0.00000	0.00000	0.00000
	B	A	0.00610	0.00635	0.01450
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00104	0.00096	0.00158

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00623	0.00623	0.01376
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00084	0.00091	0.00165
	B	A	0.00000	0.00000	0.00000
	B	A	0.00645	0.00672	0.01466
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00147	0.00142	0.00202
sky130_osu_sc_15T_hs__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00578	0.00581	0.01393
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00041	0.00033	0.00056
	B	A	0.00000	0.00000	0.00000
	B	A	0.00610	0.00637	0.01457
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00105	0.00095	0.00136

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00422	0.00410	0.00949
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00548	0.00567	0.00823
	B	A	0.00000	0.00000	0.00000
	B	A	0.00387	0.00366	0.00990
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00611	0.00612	0.00767
sky130_osu_sc_15T_hs__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00372	0.00354	0.01011
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00521	0.00530	0.00734
	B	A	0.00000	0.00000	0.00000
	B	A	0.00337	0.00312	0.01032
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00580	0.00570	0.00643

SKY130_OSU_SC_15T_HS__AND2x

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__and2_1	10.37850
sky130_osu_sc_15T_hs__and2_2	12.82050
sky130_osu_sc_15T_hs__and2_4	17.70450
sky130_osu_sc_15T_hs__and2_6	22.58850
sky130_osu_sc_15T_hs__and2_8	27.47250
sky130_osu_sc_15T_hs__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__and2_1	0.00358	0.00369	2.00751
sky130_osu_sc_15T_hs__and2_2	0.00357	0.00369	3.92042
sky130_osu_sc_15T_hs__and2_4	0.00358	0.00370	7.46400
sky130_osu_sc_15T_hs__and2_6	0.00362	0.00370	11.00828
sky130_osu_sc_15T_hs__and2_8	0.00359	0.00371	14.13704
sky130_osu_sc_15T_hs__and2_l	0.00286	0.00298	1.18120

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__and2_1	0.00000	0.01656	0.02633
sky130_osu_sc_15T_hs__and2_2	0.00000	0.02627	0.02762
sky130_osu_sc_15T_hs__and2_4	0.00000	0.04569	0.05137
sky130_osu_sc_15T_hs__and2_6	0.00000	0.06512	0.07641
sky130_osu_sc_15T_hs__and2_8	0.00000	0.08454	0.10144
sky130_osu_sc_15T_hs__and2_l	0.00000	0.01791	0.02854

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__and2_1	A->Y (RR)	0.05614	0.46610	6.15185
	B->Y (RR)	0.05974	0.47318	6.01762
sky130_osu_sc_15T_hs__and2_2	A->Y (RR)	0.06253	0.41276	6.16731
	B->Y (RR)	0.06598	0.41647	6.04828
sky130_osu_sc_15T_hs__and2_4	A->Y (RR)	0.08844	0.42366	6.34587
	B->Y (RR)	0.09197	0.42320	6.25479
sky130_osu_sc_15T_hs__and2_6	A->Y (RR)	0.11198	0.45293	6.53439
	B->Y (RR)	0.11542	0.44864	6.45870
sky130_osu_sc_15T_hs__and2_8	A->Y (RR)	0.13520	0.48526	6.64041
	B->Y (RR)	0.13874	0.47874	6.57099
sky130_osu_sc_15T_hs__and2_1	A->Y (RR)	0.06142	0.55653	5.85761
	B->Y (RR)	0.06506	0.56299	5.79399

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__and2_1	**A->Y (FF)**	0.04990	0.51050	6.48819
	B->Y (FF)	0.05254	0.52043	6.51957
sky130_osu_sc_15T_hs__and2_2	**A->Y (FF)**	0.05575	0.47236	6.36406
	B->Y (FF)	0.05865	0.48007	6.38478
sky130_osu_sc_15T_hs__and2_4	**A->Y (FF)**	0.07716	0.50143	6.74933
	B->Y (FF)	0.07963	0.50733	6.79331
sky130_osu_sc_15T_hs__and2_6	**A->Y (FF)**	0.10003	0.53222	6.94688
	B->Y (FF)	0.10196	0.53667	6.97463
sky130_osu_sc_15T_hs__and2_8	**A->Y (FF)**	0.12097	0.55743	6.96107
	B->Y (FF)	0.12263	0.56208	6.98958
sky130_osu_sc_15T_hs__and2_l	**A->Y (FF)**	0.05806	0.51371	5.34216
	B->Y (FF)	0.06339	0.52929	5.38885

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	A	0.00000	0.00000	0.00000
	A	0.00281	0.00290	0.02908
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00252	0.01796
sky130_osu_sc_15T_hs__and2_2	A	0.00000	0.00000	0.00000
	A	0.00552	0.00586	0.03235
	B	0.00000	0.00000	0.00000
	B	0.00558	0.00557	0.02107
sky130_osu_sc_15T_hs__and2_4	A	0.00000	0.00000	0.00000
	A	0.01157	0.01200	0.03562
	B	0.00000	0.00000	0.00000
	B	0.01161	0.01179	0.02575
sky130_osu_sc_15T_hs__and2_6	A	0.00000	0.00000	0.00000
	A	0.01784	0.01852	0.03997
	B	0.00000	0.00000	0.00000
	B	0.01791	0.01825	0.03065
sky130_osu_sc_15T_hs__and2_8	A	0.00000	0.00000	0.00000
	A	0.02430	0.02463	0.04515
	B	0.00000	0.00000	0.00000
	B	0.02439	0.02471	0.03575
sky130_osu_sc_15T_hs__and2_l	A	0.00000	0.00000	0.00000
	A	0.00213	0.00203	0.01377
	B	0.00000	0.00000	0.00000
	B	0.00220	0.00189	0.00835

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	A	0.00000	0.00000	0.00000
	A	0.00734	0.00823	0.02909
	B	0.00000	0.00000	0.00000
	B	0.00821	0.00896	0.02842
sky130_osu_sc_15T_hs__and2_2	A	0.00000	0.00000	0.00000
	A	0.00926	0.01038	0.03299
	B	0.00000	0.00000	0.00000
	B	0.01014	0.01105	0.03170
sky130_osu_sc_15T_hs__and2_4	A	0.00000	0.00000	0.00000
	A	0.01430	0.01578	0.03632
	B	0.00000	0.00000	0.00000
	B	0.01518	0.01634	0.03567
sky130_osu_sc_15T_hs__and2_6	A	0.00000	0.00000	0.00000
	A	0.01952	0.02141	0.04171
	B	0.00000	0.00000	0.00000
	B	0.02035	0.02183	0.04079
sky130_osu_sc_15T_hs__and2_8	A	0.00000	0.00000	0.00000
	A	0.02516	0.02703	0.04729
	B	0.00000	0.00000	0.00000
	B	0.02605	0.02704	0.04580
sky130_osu_sc_15T_hs__and2_l	A	0.00000	0.00000	0.00000
	A	0.00585	0.00616	0.01662
	B	0.00000	0.00000	0.00000
	B	0.00661	0.00678	0.01655

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00270	-0.00271	-0.00272
sky130_osu_sc_15T_hs__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00269	-0.00272	-0.00271
sky130_osu_sc_15T_hs__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00270	-0.00272	-0.00272
sky130_osu_sc_15T_hs__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00272	-0.00275	-0.00274
sky130_osu_sc_15T_hs__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00269	-0.00272	-0.00272
sky130_osu_sc_15T_hs__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00193	-0.00195	-0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00271	0.00275	0.00273
sky130_osu_sc_15T_hs__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00270	0.00274	0.00272
sky130_osu_sc_15T_hs__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00271	0.00275	0.00273
sky130_osu_sc_15T_hs__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00273	0.00277	0.00275
sky130_osu_sc_15T_hs__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00271	0.00275	0.00273
sky130_osu_sc_15T_hs__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00195	0.00197	0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00256	-0.00257	-0.00257
sky130_osu_sc_15T_hs__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00256	-0.00258	-0.00257
sky130_osu_sc_15T_hs__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00256	-0.00259	-0.00257
sky130_osu_sc_15T_hs__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00256	-0.00259	-0.00257
sky130_osu_sc_15T_hs__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00256	-0.00259	-0.00257
sky130_osu_sc_15T_hs__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00182	-0.00184	-0.00182

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00263	0.00260	0.00258
sky130_osu_sc_15T_hs__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00262	0.00260	0.00258
sky130_osu_sc_15T_hs__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00263	0.00261	0.00258
sky130_osu_sc_15T_hs__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00263	0.00260	0.00258
sky130_osu_sc_15T_hs__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00263	0.00261	0.00258
sky130_osu_sc_15T_hs__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00186	0.00185	0.00183

SKY130_OSU_SC_15T_HS__AOI21

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_hs__aoi21_l	0.00337	0.00352	0.00357	0.92018

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__aoi21_l	0.00000	0.00611	0.01252

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__aoi21_l	A0->Y (FR)	0.06649	0.86352	11.27370
	A1->Y (FR)	0.05659	0.81748	10.83560
	B0->Y (FR)	0.04822	0.83467	11.20240

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__aoi21_l	A0->Y (RF)	0.03398	0.43966	5.64574
	A1->Y (RF)	0.03051	0.44573	5.79901
	B0->Y (RF)	0.01990	0.41240	5.53933

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00623	0.00616	0.00702
	A1	0.00000	0.00000	0.00000
	A1	0.00527	0.00519	0.00611
	B0	0.00388	0.00373	0.00800

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00138	0.00117	0.00205
	A1	0.00000	0.00000	0.00000
	A1	0.00141	0.00128	0.00276
	B0	-0.00059	-0.00057	0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00209	-0.00232	-0.00231
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00235	-0.00236	-0.00235
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00234	-0.00237	-0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00230	0.00232	0.00231
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00235	0.00236	0.00236
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00241	0.00238	0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00207	-0.00228	-0.00227
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00230	-0.00232	-0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00250	-0.00252	-0.00252

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00226	0.00228	0.00227
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00230	0.00232	0.00232
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00252	0.00257	0.00253

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00116	-0.00117	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00126	0.00127	0.00119

SKY130_OSU_SC_15T_HS__AOI22

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_hs__aoi22_l	0.00336	0.00349	0.00364	0.00345	0.95159

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_hs__aoi22_l	0.00000	0.00698	0.02504

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__aoi22_l	A0->Y (FR)	0.08013	0.87591	11.33930
	A1->Y (FR)	0.07234	0.85912	11.22490
	B0->Y (FR)	0.04821	0.81875	11.11620
	B1->Y (FR)	0.05617	0.84128	11.28180

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__aoi22_l	A0->Y (RF)	0.04413	0.45737	5.78947
	A1->Y (RF)	0.04081	0.46377	5.94763
	B0->Y (RF)	0.02367	0.44185	5.92824
	B1->Y (RF)	0.02705	0.43600	5.77108

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	A0	0.00753	0.00746	0.00837
	A1	0.00657	0.00648	0.00737
	B0	0.00416	0.00425	0.00814
	B1	0.00509	0.00493	0.00900

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	A0	0.00280	0.00260	0.00345
	A1	0.00283	0.00270	0.00415
	B0	-0.00037	-0.00032	0.00119
	B1	-0.00031	-0.00038	0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00216	-0.00232	-0.00231
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00235	-0.00236	-0.00235
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00234	-0.00237	-0.00235
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00234	-0.00237	-0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00230	0.00233	0.00231
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00235	0.00236	0.00236
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00241	0.00238	0.00236
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00241	0.00238	0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00212	-0.00228	-0.00227
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00230	-0.00232	-0.00231
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00250	-0.00250	-0.00252
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00250	-0.00250	-0.00252

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00226	0.00230	0.00227
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00230	0.00232	0.00231
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00251	0.00256	0.00252
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00251	0.00256	0.00252

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00116	-0.00118	-0.00117
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00116	-0.00117	-0.00117
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00260	-0.00263	-0.00262
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00260	-0.00262	-0.00262

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00131	0.00131	0.00120
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00116	0.00117	0.00117
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00262	0.00267	0.00263
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00262	0.00262	0.00263

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00118	-0.00119	-0.00118
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00117	-0.00118	-0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00240	-0.00242	-0.00240
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00240	-0.00241	-0.00240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00132	0.00132	0.00121
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00117	0.00118	0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00246	0.00244	0.00241
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00246	0.00244	0.00241

SKY130_OSU_SC_15T_HS__BUFx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__buf_1	7.93650
sky130_osu_sc_15T_hs__buf_2	10.37850
sky130_osu_sc_15T_hs__buf_4	15.26250
sky130_osu_sc_15T_hs__buf_6	20.14650
sky130_osu_sc_15T_hs__buf_8	25.03050
sky130_osu_sc_15T_hs__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_hs__buf_1	0.00370	1.97520
sky130_osu_sc_15T_hs__buf_2	0.00370	3.93506
sky130_osu_sc_15T_hs__buf_4	0.00370	7.56149
sky130_osu_sc_15T_hs__buf_6	0.00088	1.80000
sky130_osu_sc_15T_hs__buf_8	0.00371	14.37201
sky130_osu_sc_15T_hs__buf_l	0.00300	1.19267

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__buf_1	0.00000	0.01381	0.01381
sky130_osu_sc_15T_hs__buf_2	0.00000	0.02072	0.02633
sky130_osu_sc_15T_hs__buf_4	0.00000	0.03453	0.05137
sky130_osu_sc_15T_hs__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_hs__buf_8	0.00000	0.06214	0.10144
sky130_osu_sc_15T_hs__buf_l	0.00000	0.01457	0.01457

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__buf_1	**A->Y (RR)**	0.04504	0.44614	5.96361
sky130_osu_sc_15T_hs__buf_2	**A->Y (RR)**	0.04984	0.38826	6.03328
sky130_osu_sc_15T_hs__buf_4	**A->Y (RR)**	0.06785	0.38401	6.19627
sky130_osu_sc_15T_hs__buf_8	**A->Y (RR)**	0.10233	0.42791	6.43016
sky130_osu_sc_15T_hs__buf_l	**A->Y (RR)**	0.05042	0.53783	5.75445

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__buf_1	**A->Y (FF)**	0.04733	0.50103	6.40992
sky130_osu_sc_15T_hs__buf_2	**A->Y (FF)**	0.05435	0.47901	6.60202
sky130_osu_sc_15T_hs__buf_4	**A->Y (FF)**	0.07514	0.49823	6.82685
sky130_osu_sc_15T_hs__buf_8	**A->Y (FF)**	0.11877	0.55672	7.03928
sky130_osu_sc_15T_hs__buf_l	**A->Y (FF)**	0.05577	0.50816	5.35491

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__buf_1	A	0.00000	0.00000	0.00000
	A	0.00262	0.00267	0.02155
sky130_osu_sc_15T_hs__buf_2	A	0.00000	0.00000	0.00000
	A	0.00531	0.00544	0.02434
sky130_osu_sc_15T_hs__buf_4	A	0.00000	0.00000	0.00000
	A	0.01128	0.01187	0.03023
sky130_osu_sc_15T_hs__buf_8	A	0.00000	0.00000	0.00000
	A	0.02351	0.02454	0.04123
sky130_osu_sc_15T_hs__buf_l	A	0.00000	0.00000	0.00000
	A	0.00208	0.00218	0.01038

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__buf_1	A	0.00000	0.00000	0.00000
	A	0.00709	0.00798	0.02827
sky130_osu_sc_15T_hs__buf_2	A	0.00000	0.00000	0.00000
	A	0.00903	0.01004	0.03032
sky130_osu_sc_15T_hs__buf_4	A	0.00000	0.00000	0.00000
	A	0.01408	0.01527	0.03525
sky130_osu_sc_15T_hs__buf_8	A	0.00000	0.00000	0.00000
	A	0.02491	0.02613	0.04555
sky130_osu_sc_15T_hs__buf_l	A	0.00000	0.00000	0.00000
	A	0.00568	0.00593	0.01613

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_hs__buf_6	0.00000	0.00000	0.00000
	-0.00052	-0.00052	-0.00051

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_hs__buf_6	0.00000	0.00000	0.00000
	0.00052	0.00052	0.00051

SKY130_OSU_SC_15T_HS__DFFRx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__dffr_1	53.11350
sky130_osu_sc_15T_hs__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_hs__dffr_1	0.00346	0.00344	0.01036	1.81738	1.82834
sky130_osu_sc_15T_hs__dffr_l	0.00346	0.00344	0.01035	1.18584	1.18499

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__dffr_1	0.00000	0.04555	0.06229
sky130_osu_sc_15T_hs__dffr_l	0.00000	0.04588	0.06261

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffr_1	CK->Q (RR)	0.24296	1.11800	13.49840
	QN->Q (FR)	0.02731	0.81071	13.15150
sky130_osu_sc_15T_hs__dffr_l	CK->Q (RR)	0.24879	1.29385	13.89050
	QN->Q (FR)	0.03113	0.87476	12.82620

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffr_1	CK->Q (RF)	0.23282	1.10283	13.52630
	QN->Q (RF)	0.01867	0.53165	8.61834
	RN->Q (FF)	0.17382	1.21683	16.03410
sky130_osu_sc_15T_hs__dffr_l	CK->Q (RF)	0.24312	1.30332	14.13160
	QN->Q (RF)	0.02161	0.58338	8.57914
	RN->Q (FF)	0.18448	1.41780	16.63690

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffr_1	CK->QN (RR)	0.21005	0.64161	6.00856
	RN->QN (FR)	0.15098	0.75640	8.51857
sky130_osu_sc_15T_hs__dffr_l	CK->QN (RR)	0.21300	0.71578	6.01898
	RN->QN (FR)	0.15413	0.83027	8.52152

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffr_1	**CK->QN (RF)**	0.20424	0.51872	3.76942
sky130_osu_sc_15T_hs__dffr_l	**CK->QN (RF)**	0.20302	0.56275	3.83202

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_hs__dffr_1	hold	CK (R)	-0.04546	-0.06541	-0.19415
	setup	CK (R)	0.19375	0.23692	0.55801
sky130_osu_sc_15T_hs__dffr_l	hold	CK (R)	-0.04597	-0.06887	-0.19254
	setup	CK (R)	0.19318	0.23398	0.56283

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	hold	CK (R)	-0.09500	-0.32268	-4.25792
	setup	CK (R)	0.11986	0.33387	4.31390
sky130_osu_sc_15T_hs__dffr_l	hold	CK (R)	-0.09669	-0.32310	-4.25812
	setup	CK (R)	0.12067	0.33381	4.31401

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	hold	CK (R)	-0.04546	-0.06541	-0.19415
	setup	CK (R)	0.19375	0.23692	0.55801
sky130_osu_sc_15T_hs__dffr_l	hold	CK (R)	-0.04597	-0.06887	-0.19254
	setup	CK (R)	0.19318	0.23398	0.56283

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	hold	CK (R)	-0.09500	-0.32268	-4.25792
	setup	CK (R)	0.11986	0.33387	4.31390
sky130_osu_sc_15T_hs__dffr_l	hold	CK (R)	-0.09669	-0.32310	-4.25812
	setup	CK (R)	0.12067	0.33381	4.31401

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	recovery	CK (R)	0.17085	0.20571	0.82454
	removal	CK (R)	-0.04388	-0.05126	-0.16058
sky130_osu_sc_15T_hs__dffr_l	recovery	CK (R)	0.16997	0.20421	0.82717
	removal	CK (R)	-0.04388	-0.05126	-0.16058

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	recovery	CK (R)	0.17085	0.20571	0.82454
	removal	CK (R)	-0.04388	-0.05126	-0.16058
sky130_osu_sc_15T_hs__dffr_l	recovery	CK (R)	0.16997	0.20421	0.82717
	removal	CK (R)	-0.04388	-0.05126	-0.16058

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffr_1	min_pulse_width	RN ()	0.10580	0.42114	13.33370
	min_pulse_width	RN ()	0.10580	0.42114	13.33370
sky130_osu_sc_15T_hs__dffr_l	min_pulse_width	RN ()	0.10580	0.42114	13.33370
	min_pulse_width	RN ()	0.10580	0.42114	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_hs__dffr_1	min_pulse_width	CK ()	0.11536	0.42114	13.33370
	min_pulse_width	CK ()	0.12173	0.42114	13.33370
sky130_osu_sc_15T_hs__dffr_l	min_pulse_width	CK ()	0.10580	0.42114	13.33370
	min_pulse_width	CK ()	0.11854	0.42114	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_hs__dffr_1	min_pulse_width	CK ()	0.24277	0.42114	13.33370
	min_pulse_width	CK ()	0.09943	0.42114	13.33370
sky130_osu_sc_15T_hs__dffr_l	min_pulse_width	CK ()	0.24277	0.42114	13.33370
	min_pulse_width	CK ()	0.09943	0.42114	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00714	0.00512	0.00000
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00626	0.00519	0.01034

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00804	0.00621	0.00000
	RN	-0.00094	-0.06536	-1.10569
	RN	0.01837	0.01677	0.00245
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00716	0.00615	0.00856
	RN	-0.00094	-0.05059	-0.72146
	RN	0.01749	0.01671	0.01859

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00803	0.00620	0.00000
	RN	-0.00094	-0.06560	-1.11236
	RN	0.01836	0.01677	0.00233
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00716	0.00615	0.00850
	RN	-0.00094	-0.05057	-0.72095
	RN	0.01749	0.01671	0.01849

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00710	0.00511	0.00000
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00622	0.00516	0.00988

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00196	-0.00230	-0.00229
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00858	0.00819	0.01911
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00380	0.00347	0.01450
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00196	-0.00230	-0.00229
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00858	0.00819	0.01911
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00380	0.00347	0.01450

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00228	0.00230	0.00229
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01390	0.01365	0.02459
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00643	0.00626	0.01712
sky130_osu_sc_15T_hs__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00228	0.00230	0.00229
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01390	0.01366	0.02459
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00643	0.00626	0.01712

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00281	0.00291	0.03041
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00784	0.00773	0.03507
sky130_osu_sc_15T_hs__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00281	0.00291	0.03041
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00784	0.00773	0.03507

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00673	0.00740	0.03493
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01420	0.01475	0.04167
sky130_osu_sc_15T_hs__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00673	0.00740	0.03493
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01420	0.01475	0.04167

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00050	-0.00057	0.02683
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00399	0.00328	0.03183
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00077	-0.00084	0.02638
sky130_osu_sc_15T_hs__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00050	-0.00057	0.02683
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00400	0.00329	0.03183
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00077	-0.00084	0.02638

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01054	0.01115	0.03874
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02202	0.02198	0.05592
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01688	0.01729	0.04518
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02163	0.02269	0.06851
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01164	0.01219	0.03932
sky130_osu_sc_15T_hs__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01054	0.01117	0.03874
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02202	0.02198	0.05592
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01687	0.01729	0.04518
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02163	0.02270	0.06851
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01163	0.01219	0.03932

SKY130_OSU_SC_15T_HS__DFFSRx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__dffsr_1	57.99750
sky130_osu_sc_15T_hs__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_hs__dffsr_1	0.00342	0.00345	0.00768	0.01062	2.06313	2.04340
sky130_osu_sc_15T_hs__dffsr_l	0.00342	0.00345	0.00767	0.01061	1.18339	1.18925

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_hs__dffsr_1	0.00000	0.04587	0.06148
sky130_osu_sc_15T_hs__dffsr_l	0.00000	0.04620	0.06180

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffsr_1	CK->Q (RR)	0.23111	1.13586	14.68950
	QN->Q (FR)	0.02354	0.75062	12.55920
	RN->Q (RR)	0.18760	1.10261	14.70010
	SN->Q (FR)	0.17288	1.27626	17.47840
sky130_osu_sc_15T_hs__dffsr_l	CK->Q (RR)	0.24397	1.29283	13.85760
	QN->Q (FR)	0.03113	0.87230	12.78540
	RN->Q (RR)	0.20049	1.26069	13.86670
	SN->Q (FR)	0.18548	1.43152	16.63980

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffsr_1	CK->Q (RF)	0.25155	1.14027	14.53680
	QN->Q (RF)	0.01844	0.55592	9.31812
	RN->Q (FF)	0.18151	1.24861	17.06300
sky130_osu_sc_15T_hs__dffsr_l	CK->Q (RF)	0.26744	1.32960	14.12120
	QN->Q (RF)	0.02156	0.58234	8.56165
	RN->Q (FF)	0.19640	1.43572	16.64200

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffsr_1	CK->QN (RR)	0.22890	0.65028	6.07635
	RN->QN (FR)	0.15904	0.75884	8.60011
sky130_osu_sc_15T_hs__dffsr_l	CK->QN (RR)	0.23701	0.74415	6.07098
	RN->QN (FR)	0.16615	0.85151	8.58781

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffsr_1	CK->QN (RF)	0.19695	0.53146	4.29580
	RN->QN (RF)	0.15387	0.49901	4.30752
	SN->QN (FF)	0.13919	0.67260	7.07668
sky130_osu_sc_15T_hs__dffsr_l	CK->QN (RF)	0.20041	0.56478	3.85574
	RN->QN (RF)	0.15718	0.53289	3.86543
	SN->QN (FF)	0.14237	0.70436	6.63640

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_hs__dffsr_1	hold	CK (R)	-0.04474	-0.07028	-0.21644
	setup	CK (R)	0.17757	0.21651	0.59666
sky130_osu_sc_15T_hs__dffsr_l	hold	CK (R)	-0.04608	-0.07028	-0.21644
	setup	CK (R)	0.17452	0.21715	0.60148

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	hold	CK (R)	-0.10447	-0.33238	-4.30936
	setup	CK (R)	0.13209	0.34532	4.35237
sky130_osu_sc_15T_hs__dffsr_l	hold	CK (R)	-0.10326	-0.33177	-4.30742
	setup	CK (R)	0.12809	0.34532	4.35166

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	hold	CK (R)	-0.04474	-0.07028	-0.21644
	setup	CK (R)	0.17757	0.21651	0.59666
sky130_osu_sc_15T_hs__dffsr_l	hold	CK (R)	-0.04608	-0.07028	-0.21644
	setup	CK (R)	0.17452	0.21715	0.60148

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	hold	CK (R)	-0.10447	-0.33238	-4.30936
	setup	CK (R)	0.13209	0.34532	4.35237
sky130_osu_sc_15T_hs__dffsr_l	hold	CK (R)	-0.10326	-0.33177	-4.30742
	setup	CK (R)	0.12809	0.34532	4.35166

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	recovery	CK (R)	0.13723	0.17116	0.73793
	removal	CK (R)	-0.01942	-0.02377	-0.06610
	hold	SN (R)	-0.13559	-0.27419	-1.29023
	setup	SN (R)	0.15636	0.31969	3.34267
sky130_osu_sc_15T_hs__dffsr_l	recovery	CK (R)	0.13603	0.16862	0.74095
	removal	CK (R)	-0.01942	-0.02377	-0.06610
	hold	SN (R)	-0.13730	-0.27150	-1.26645
	setup	SN (R)	0.15558	0.31721	3.34663

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	recovery	CK (R)	0.13723	0.17116	0.73793
	removal	CK (R)	-0.01942	-0.02377	-0.06610
	hold	SN (R)	-0.13559	-0.27419	-1.29023
	hold	SN (R)	-0.13673	-0.27517	-1.29488
	setup	SN (R)	0.15492	0.31871	3.10327
	setup	SN (R)	0.15636	0.31969	3.34267
sky130_osu_sc_15T_hs__dffsr_l	recovery	CK (R)	0.13603	0.16862	0.74095
	removal	CK (R)	-0.01942	-0.02377	-0.06610
	hold	SN (R)	-0.13961	-0.27150	-1.27045
	hold	SN (R)	-0.13730	-0.27150	-1.26645
	setup	SN (R)	0.15558	0.31471	3.06949
	setup	SN (R)	0.14704	0.31721	3.34663

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	min_pulse_width	RN ()	0.12491	0.42114	13.33370
	min_pulse_width	RN ()	0.12810	0.42114	13.33370
sky130_osu_sc_15T_hs__dffsr_l	min_pulse_width	RN ()	0.12491	0.42114	13.33370
	min_pulse_width	RN ()	0.12173	0.42114	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_hs__dffsr_1	recovery	CK (R)	0.03409	0.06657	3.09016
	removal	CK (R)	-0.01297	-0.04687	-0.18666
sky130_osu_sc_15T_hs__dffsr_l	recovery	CK (R)	0.03035	0.06497	3.07326
	removal	CK (R)	-0.01297	-0.04687	-0.18666

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	recovery	CK (R)	0.03409	0.06657	3.09016
	removal	CK (R)	-0.01297	-0.04687	-0.18666
sky130_osu_sc_15T_hs__dffsr_l	recovery	CK (R)	0.03035	0.06497	3.07326
	removal	CK (R)	-0.01297	-0.04687	-0.18666

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	min_pulse_width	SN ()	0.13765	0.42114	13.33370
	min_pulse_width	SN ()	0.14084	0.42114	13.33370
sky130_osu_sc_15T_hs__dffsr_l	min_pulse_width	SN ()	0.13765	0.42114	13.33370
	min_pulse_width	SN ()	0.13447	0.42114	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_hs__dffsr_1	min_pulse_width	CK ()	0.10261	0.42114	13.33370
	min_pulse_width	CK ()	0.13128	0.42114	13.33370
sky130_osu_sc_15T_hs__dffsr_l	min_pulse_width	CK ()	0.09943	0.42114	13.33370
	min_pulse_width	CK ()	0.12810	0.42114	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_hs__dffsr_1	min_pulse_width	CK ()	0.22684	0.42114	13.33370
	min_pulse_width	CK ()	0.11217	0.42114	13.33370
sky130_osu_sc_15T_hs__dffsr_l	min_pulse_width	CK ()	0.22366	0.42114	13.33370
	min_pulse_width	CK ()	0.10899	0.42114	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00886	0.00663	-0.00321
	RN	0.01654	0.01416	-0.01214
	SN	-0.00094	-0.07053	-1.25521
	SN	0.01826	0.01566	-0.01683
sky130_osu_sc_15T_hs__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00809	0.00701	0.01221
	RN	0.01575	0.01455	0.01367
	SN	-0.00094	-0.05053	-0.71997
	SN	0.01748	0.01606	0.00878

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00941	0.00829	0.00321
	RN	-0.00094	-0.07053	-1.25520
	RN	0.01924	0.01824	0.01309
sky130_osu_sc_15T_hs__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00860	0.00766	0.01022
	RN	-0.00094	-0.05053	-0.71997
	RN	0.01841	0.01760	0.01980

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00940	0.00829	0.00363
	RN	-0.00094	-0.07012	-1.24319
	RN	0.01923	0.01825	0.01318
sky130_osu_sc_15T_hs__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00860	0.00767	0.01008
	RN	-0.00094	-0.05068	-0.72354
	RN	0.01841	0.01758	0.01967

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00883	0.00660	-0.00363
	RN	0.01650	0.01413	-0.01165
	SN	-0.00094	-0.07012	-1.24314
	SN	0.01822	0.01565	-0.01646
sky130_osu_sc_15T_hs__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00805	0.00698	0.01160
	RN	0.01571	0.01451	0.01328
	SN	-0.00094	-0.05068	-0.72351
	SN	0.01744	0.01603	0.00886

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00222	-0.00230	-0.00229
	(!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)	0.01105	0.01066	0.02146
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00432	0.00400	0.01485
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00428	0.00398	0.01484
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00433	0.00403	0.01489
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00222	-0.00230	-0.00229
	(!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)	0.01105	0.01066	0.02147
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00432	0.00400	0.01485
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00428	0.00398	0.01484
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00433	0.00403	0.01489

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00233	0.00231	0.00229
	(!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)	0.01620	0.01592	0.02642
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00695	0.00683	0.01744
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00698	0.00684	0.01744
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00691	0.00677	0.01739
sky130_osu_sc_15T_hs__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00233	0.00231	0.00229
	(!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)	0.01619	0.01591	0.02641
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00694	0.00682	0.01744
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00697	0.00683	0.01743
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00690	0.00676	0.01739

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__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)	0.00249	0.00251	0.02982
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00950	0.00925	0.03684
sky130_osu_sc_15T_hs__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)	0.00249	0.00251	0.02983
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00950	0.00925	0.03684

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__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)	0.00735	0.00810	0.03563
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01511	0.01560	0.04260
sky130_osu_sc_15T_hs__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)	0.00734	0.00809	0.03562
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01510	0.01558	0.04259

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__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)	-0.00533	-0.00535	-0.00537
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00546	-0.00580	-0.00577
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00529	-0.00544	-0.00545
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00347	0.00335	0.01663
sky130_osu_sc_15T_hs__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)	-0.00533	-0.00535	-0.00537
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00544	-0.00579	-0.00576
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00528	-0.00543	-0.00545
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00348	0.00336	0.01664

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__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)	0.00535	0.00547	0.00538
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00576	0.00581	0.00578
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00543	0.00548	0.00546
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01150	0.01121	0.02221
sky130_osu_sc_15T_hs__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)	0.00535	0.00547	0.00538
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00574	0.00579	0.00576
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00543	0.00547	0.00546
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01149	0.01121	0.02221

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00050	-0.00058	0.02682
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00471	0.00404	0.03252
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00464	0.00400	0.03246
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00062	-0.00068	0.02654
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00316	0.00303	0.05441
sky130_osu_sc_15T_hs__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00050	-0.00058	0.02682
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00470	0.00404	0.03251
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00463	0.00396	0.03245
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00062	-0.00069	0.02654
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00316	0.00303	0.05442

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_hs__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02464	0.02464	0.05855
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01059	0.01124	0.03879
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01719	0.01754	0.04540
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01723	0.01750	0.04541
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02387	0.02474	0.07051
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01152	0.01208	0.03920
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01385	0.01497	0.06628
sky130_osu_sc_15T_hs__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02464	0.02464	0.05855
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01059	0.01124	0.03879
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01719	0.01754	0.04540
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01723	0.01750	0.04541
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02386	0.02473	0.07049
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01152	0.01209	0.03920
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01384	0.01496	0.06628

SKY130_OSU_SC_15T_HS__DFFSx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__dffs_1	48.22950
sky130_osu_sc_15T_hs__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_hs__dffs_1	0.00345	0.00613	0.01035	1.84456	1.82531
sky130_osu_sc_15T_hs__dffs_l	0.00345	0.00613	0.01035	1.18003	1.19755

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__dffs_1	0.00000	0.04869	0.08554
sky130_osu_sc_15T_hs__dffs_l	0.00000	0.04901	0.08587

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffs_1	CK->Q (RR)	0.18427	1.05461	13.58860
	QN->Q (FR)	0.02730	0.81033	13.19640
	SN->Q (FR)	0.14874	1.25283	16.37650
sky130_osu_sc_15T_hs__dffs_l	CK->Q (RR)	0.19289	1.22699	13.71660
	QN->Q (FR)	0.03110	0.86996	12.73710
	SN->Q (FR)	0.15690	1.42094	16.50330

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffs_1	CK->Q (RF)	0.25536	1.13497	13.71820
	QN->Q (RF)	0.01857	0.53254	8.65698
sky130_osu_sc_15T_hs__dffs_l	CK->Q (RF)	0.26531	1.32330	14.04740
	QN->Q (RF)	0.02153	0.58004	8.53281

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffs_1	CK->QN (RR)	0.23213	0.66647	5.99483
sky130_osu_sc_15T_hs__dffs_l	CK->QN (RR)	0.23461	0.74238	6.09330

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dffs_1	CK->QN (RF)	0.14978	0.45145	3.67526
	SN->QN (FF)	0.11350	0.64917	6.46591
sky130_osu_sc_15T_hs__dffs_l	CK->QN (RF)	0.15121	0.50336	3.80063
	SN->QN (FF)	0.11461	0.69747	6.58017

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_hs__dffs_1	hold	CK (R)	-0.03424	-0.05496	-0.16313
	setup	CK (R)	0.13428	0.18213	0.49855
sky130_osu_sc_15T_hs__dffs_l	hold	CK (R)	-0.03371	-0.05300	-0.16392
	setup	CK (R)	0.13475	0.17999	0.50404

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	hold	CK (R)	-0.09742	-0.32280	-4.28422
	setup	CK (R)	0.12937	0.33746	4.33532
sky130_osu_sc_15T_hs__dffs_l	hold	CK (R)	-0.09699	-0.32280	-4.28308
	setup	CK (R)	0.12937	0.33746	4.33550

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	hold	CK (R)	-0.03424	-0.05496	-0.16313
	setup	CK (R)	0.13428	0.18213	0.49855
sky130_osu_sc_15T_hs__dffs_l	hold	CK (R)	-0.03371	-0.05300	-0.16392
	setup	CK (R)	0.13475	0.17999	0.50404

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	hold	CK (R)	-0.09742	-0.32280	-4.28422
	setup	CK (R)	0.12937	0.33746	4.33532
sky130_osu_sc_15T_hs__dffs_l	hold	CK (R)	-0.09699	-0.32280	-4.28308
	setup	CK (R)	0.12937	0.33746	4.33550

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	recovery	CK (R)	0.04460	0.09054	2.77534
	removal	CK (R)	-0.01995	-0.06851	-0.34405
sky130_osu_sc_15T_hs__dffs_l	recovery	CK (R)	0.04352	0.09054	2.68466
	removal	CK (R)	-0.01995	-0.06851	-0.34405

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	recovery	CK (R)	0.04460	0.09054	2.77534
	removal	CK (R)	-0.01995	-0.06851	-0.34405
sky130_osu_sc_15T_hs__dffs_l	recovery	CK (R)	0.04352	0.09054	2.68466
	removal	CK (R)	-0.01995	-0.06851	-0.34405

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dffs_1	min_pulse_width	SN ()	0.10580	0.42114	13.33370
	min_pulse_width	SN ()	0.10899	0.42114	13.33370
sky130_osu_sc_15T_hs__dffs_l	min_pulse_width	SN ()	0.10580	0.42114	13.33370
	min_pulse_width	SN ()	0.10580	0.42114	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_hs__dffs_1	min_pulse_width	CK ()	0.07713	0.42114	13.33370
	min_pulse_width	CK ()	0.12810	0.42114	13.33370
sky130_osu_sc_15T_hs__dffs_l	min_pulse_width	CK ()	0.07395	0.42114	13.33370
	min_pulse_width	CK ()	0.12491	0.42114	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_hs__dffs_1	min_pulse_width	CK ()	0.18225	0.42114	13.33370
	min_pulse_width	CK ()	0.11217	0.42114	13.33370
sky130_osu_sc_15T_hs__dffs_l	min_pulse_width	CK ()	0.18225	0.42114	13.33370
	min_pulse_width	CK ()	0.11217	0.42114	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00715	0.00514	0.00000
	SN	-0.00094	-0.06595	-1.12223
	SN	0.01547	0.01318	-0.01334
sky130_osu_sc_15T_hs__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00627	0.00521	0.01086
	SN	-0.00094	-0.05044	-0.71793
	SN	0.01458	0.01324	0.00678

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00622	0.00000
sky130_osu_sc_15T_hs__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00713	0.00617	0.00891

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00623	0.00000
sky130_osu_sc_15T_hs__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00713	0.00617	0.00876

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00711	0.00515	0.00000
	SN	-0.00094	-0.06553	-1.11045
	SN	0.01544	0.01316	-0.01286
sky130_osu_sc_15T_hs__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00624	0.00518	0.00998
	SN	-0.00094	-0.05089	-0.72857
	SN	0.01455	0.01319	0.00615

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00234	-0.00233
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00827	0.00784	0.01886
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00371	0.00341	0.01441
sky130_osu_sc_15T_hs__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00234	-0.00233
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00827	0.00784	0.01886
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00371	0.00341	0.01442

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00237	0.00235	0.00233
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01377	0.01348	0.02424
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00657	0.00643	0.01730
sky130_osu_sc_15T_hs__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00237	0.00235	0.00233
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01377	0.01348	0.02424
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00657	0.00643	0.01730

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00388	-0.00390	-0.00390
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00297	0.00262	0.01011
sky130_osu_sc_15T_hs__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00387	-0.00390	-0.00390
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00297	0.00262	0.01011

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00392	0.00395	0.00391
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00802	0.00779	0.01640
sky130_osu_sc_15T_hs__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00391	0.00395	0.00391
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00803	0.00779	0.01640

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00052	-0.00060	0.02683
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00073	-0.00081	0.02646
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00252	0.00250	0.05431
sky130_osu_sc_15T_hs__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00052	-0.00060	0.02683
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00074	-0.00081	0.02646
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00252	0.00250	0.05431

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02180	0.02176	0.05624
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01055	0.01117	0.03879
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02139	0.02229	0.06818
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01158	0.01215	0.03930
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01340	0.01458	0.06641
sky130_osu_sc_15T_hs__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02180	0.02176	0.05624
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01055	0.01117	0.03879
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02138	0.02230	0.06818
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01158	0.01215	0.03930
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01340	0.01459	0.06642

SKY130_OSU_SC_15T_HS__DFFx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__dff_1	40.29300
sky130_osu_sc_15T_hs__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_hs__dff_1	0.00360	0.01016	2.05565	2.06446
sky130_osu_sc_15T_hs__dff_l	0.00360	0.01014	1.07304	1.06853

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__dff_1	0.00000	0.04298	0.05470
sky130_osu_sc_15T_hs__dff_l	0.00000	0.04374	0.05545

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dff_1	CK->Q (RR)	0.14761	1.03217	14.44060
	QN->Q (FR)	0.02337	0.74709	12.48340
sky130_osu_sc_15T_hs__dff_l	CK->Q (RR)	0.15517	1.03886	11.04420
	QN->Q (FR)	0.03632	0.93742	13.38950

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dff_1	CK->Q (RF)	0.21092	1.09106	14.39650
	QN->Q (RF)	0.01837	0.55361	9.27313
sky130_osu_sc_15T_hs__dff_l	CK->Q (RF)	0.22771	1.17813	12.00030
	QN->Q (RF)	0.01836	0.48592	7.01146

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dff_1	CK->QN (RR)	0.18871	0.60635	6.06900
sky130_osu_sc_15T_hs__dff_l	CK->QN (RR)	0.20231	0.71896	5.92483

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__dff_1	CK->QN (RF)	0.11765	0.43431	4.17443
sky130_osu_sc_15T_hs__dff_l	CK->QN (RF)	0.11567	0.37152	2.20680

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_hs__dff_1	hold	CK (R)	-0.02764	-0.04687	-0.17188
	setup	CK (R)	0.09898	0.15089	0.48212
sky130_osu_sc_15T_hs__dff_l	hold	CK (R)	-0.02849	-0.04687	-0.17006
	setup	CK (R)	0.09787	0.15125	0.48546

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dff_1	hold	CK (R)	-0.08549	-0.31730	-4.27161
	setup	CK (R)	0.10475	0.33173	4.31049
sky130_osu_sc_15T_hs__dff_l	hold	CK (R)	-0.08556	-0.31730	-4.27004
	setup	CK (R)	0.10475	0.33173	4.31173

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_hs__dff_1	min_pulse_width	CK ()	0.06121	0.42114	13.33370
	min_pulse_width	CK ()	0.10899	0.42114	13.33370
sky130_osu_sc_15T_hs__dff_l	min_pulse_width	CK ()	0.06121	0.42114	13.33370
	min_pulse_width	CK ()	0.10899	0.42114	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_hs__dff_1	**min_pulse_width**	**CK ()**	0.14402	0.42114	13.33370
	min_pulse_width	**CK ()**	0.08350	0.42114	13.33370
sky130_osu_sc_15T_hs__dff_l	**min_pulse_width**	**CK ()**	0.14402	0.42114	13.33370
	min_pulse_width	**CK ()**	0.08350	0.42114	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00755	0.00513	-0.00275
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00695	0.00559	0.00894

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00815	0.00705	0.00275
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00749	0.00618	0.00463

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00815	0.00706	0.00282
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00749	0.00619	0.00480

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00751	0.00521	-0.00282
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00690	0.00557	0.00859

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00196	-0.00227	-0.00229
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00771	0.00741	0.01876
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00196	-0.00227	-0.00229
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00771	0.00741	0.01876

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00227	0.00230	0.00229
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01429	0.01398	0.02526
sky130_osu_sc_15T_hs__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00227	0.00230	0.00229
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01429	0.01398	0.02527

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00052	-0.00058	0.02686
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00072	-0.00078	0.02649
sky130_osu_sc_15T_hs__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00052	-0.00059	0.02686
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00072	-0.00078	0.02649

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01049	0.01112	0.03874
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02127	0.02134	0.05620
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02177	0.02266	0.06930
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01151	0.01209	0.03924
sky130_osu_sc_15T_hs__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01049	0.01112	0.03874
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02128	0.02128	0.05620
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02177	0.02267	0.06930
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01151	0.01208	0.03924

SKY130_OSU_SC_15T_HS__INVx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__inv_1	5.49450
sky130_osu_sc_15T_hs__inv_10	27.47250
sky130_osu_sc_15T_hs__inv_2	7.93650
sky130_osu_sc_15T_hs__inv_3	10.37850
sky130_osu_sc_15T_hs__inv_4	12.82050
sky130_osu_sc_15T_hs__inv_6	17.70450
sky130_osu_sc_15T_hs__inv_8	22.58850
sky130_osu_sc_15T_hs__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_hs__inv_1	0.00348	1.90616
sky130_osu_sc_15T_hs__inv_10	0.03170	17.19287
sky130_osu_sc_15T_hs__inv_2	0.00655	3.76315
sky130_osu_sc_15T_hs__inv_3	0.00972	5.39514
sky130_osu_sc_15T_hs__inv_4	0.01283	7.26749
sky130_osu_sc_15T_hs__inv_6	0.01921	10.69285
sky130_osu_sc_15T_hs__inv_8	0.02544	14.42044
sky130_osu_sc_15T_hs__inv_l	0.00276	1.04601

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__inv_1	0.00000	0.00690	0.01252
sky130_osu_sc_15T_hs__inv_10	0.00000	0.06905	0.12519
sky130_osu_sc_15T_hs__inv_2	0.00000	0.01381	0.02504
sky130_osu_sc_15T_hs__inv_3	0.00000	0.02072	0.03756
sky130_osu_sc_15T_hs__inv_4	0.00000	0.02762	0.05008
sky130_osu_sc_15T_hs__inv_6	0.00000	0.04143	0.07512
sky130_osu_sc_15T_hs__inv_8	0.00000	0.05524	0.10015
sky130_osu_sc_15T_hs__inv_l	0.00000	0.00728	0.01397

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__inv_1	**A->Y (FR)**	0.02229	0.68325	11.17550
sky130_osu_sc_15T_hs__inv_10	**A->Y (FR)**	0.03361	0.47212	11.13820
sky130_osu_sc_15T_hs__inv_2	**A->Y (FR)**	0.01809	0.58951	11.12130
sky130_osu_sc_15T_hs__inv_3	**A->Y (FR)**	0.02026	0.55552	11.13490
sky130_osu_sc_15T_hs__inv_4	**A->Y (FR)**	0.02089	0.52635	11.11680
sky130_osu_sc_15T_hs__inv_6	**A->Y (FR)**	0.02342	0.49863	11.11750
sky130_osu_sc_15T_hs__inv_8	**A->Y (FR)**	0.02842	0.48469	11.28430
sky130_osu_sc_15T_hs__inv_l	**A->Y (FR)**	0.03092	0.79968	11.35950

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__inv_1	**A->Y (RF)**	0.01624	0.46887	7.70383
sky130_osu_sc_15T_hs__inv_10	**A->Y (RF)**	0.02406	0.27548	7.63019
sky130_osu_sc_15T_hs__inv_2	**A->Y (RF)**	0.01332	0.39415	7.69515
sky130_osu_sc_15T_hs__inv_3	**A->Y (RF)**	0.01464	0.36325	7.75546
sky130_osu_sc_15T_hs__inv_4	**A->Y (RF)**	0.01448	0.33649	7.74806
sky130_osu_sc_15T_hs__inv_6	**A->Y (RF)**	0.01752	0.30651	7.73931
sky130_osu_sc_15T_hs__inv_8	**A->Y (RF)**	0.02114	0.29147	7.84195
sky130_osu_sc_15T_hs__inv_l	**A->Y (RF)**	0.01646	0.42167	5.98591

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__inv_1	A	0.00000	0.00000	0.00000
	A	0.00358	0.00379	0.00345
sky130_osu_sc_15T_hs__inv_10	A	0.00000	0.00000	0.00000
	A	0.03024	0.03626	0.05224
sky130_osu_sc_15T_hs__inv_2	A	0.00000	0.00000	0.00000
	A	0.00629	0.00666	0.01297
sky130_osu_sc_15T_hs__inv_3	A	0.00000	0.00000	0.00000
	A	0.00968	0.01085	0.01420
sky130_osu_sc_15T_hs__inv_4	A	0.00000	0.00000	0.00000
	A	0.01242	0.01331	0.02090
sky130_osu_sc_15T_hs__inv_6	A	0.00000	0.00000	0.00000
	A	0.01836	0.02174	0.03351
sky130_osu_sc_15T_hs__inv_8	A	0.00000	0.00000	0.00000
	A	0.02420	0.02816	0.04884
sky130_osu_sc_15T_hs__inv_l	A	0.00000	0.00000	0.00000
	A	0.00279	0.00285	0.00441

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00070	-0.00063	0.00045
sky130_osu_sc_15T_hs__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01150	-0.01031	0.00197
sky130_osu_sc_15T_hs__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00230	-0.00201	0.00023
sky130_osu_sc_15T_hs__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00301	-0.00269	0.00079
sky130_osu_sc_15T_hs__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00466	-0.00408	0.00057
sky130_osu_sc_15T_hs__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00709	-0.00595	0.00097
sky130_osu_sc_15T_hs__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00950	-0.00832	0.00130
sky130_osu_sc_15T_hs__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00044	-0.00039	0.00013

SKY130_OSU_SC_15T_HS__MUX2

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_15T_hs__mux2_1	0.42199	0.42210	0.00713	0.42729

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__mux2_1	0.00000	0.01396	0.01396

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__mux2_1	A0->Y (RR)	-	0.01016	0.19722	1.96823
	A1->Y (RR)	-	0.01126	0.19885	1.96399
	S0->Y (RR)	(!A0 * A1)	0.03443	0.19515	0.70583
	S0->Y (FR)	(A0 * !A1)	0.02945	0.35385	3.60811

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__mux2_1	A0->Y (FF)	-	0.01080	0.21468	2.29133
	A1->Y (FF)	-	0.01022	0.21294	2.28233
	S0->Y (FF)	(!A0 * A1)	0.04771	0.33485	2.86022
	S0->Y (RF)	(A0 * !A1)	0.01869	0.22190	1.75601

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00387	-0.00388	-0.00388
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00262	-0.00262	-0.00262
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00450	0.00567	0.03408
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00253	-0.00232	0.02598

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00387	0.00388	0.00388
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00262	0.00262	0.00262
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00076	0.00108	0.02978
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00991	0.01092	0.03876

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00097	-0.00097	-0.00097

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00097	0.00097	0.00097

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00116	-0.00116	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00116	0.00116	0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00090	-0.00061	0.02786
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00088	-0.00063	0.02796

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00748	0.00832	0.03648
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00691	0.00787	0.03633

SKY130_OSU_SC_15T_HS__NAND2x

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__nand2_1	7.93650
sky130_osu_sc_15T_hs__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__nand2_1	0.00348	0.00347	1.88077
sky130_osu_sc_15T_hs__nand2_l	0.00276	0.00276	1.03869

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__nand2_1	0.00000	0.00685	0.02504
sky130_osu_sc_15T_hs__nand2_l	0.00000	0.00728	0.02794

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__nand2_1	A->Y (FR)	0.02299	0.68559	11.16310
	B->Y (FR)	0.02674	0.67504	10.98280
sky130_osu_sc_15T_hs__nand2_l	A->Y (FR)	0.03185	0.80066	11.35640
	B->Y (FR)	0.03855	0.80419	11.32530

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__nand2_1	A->Y (RF)	0.02222	0.56403	9.28583
	B->Y (RF)	0.02541	0.56326	9.16232
sky130_osu_sc_15T_hs__nand2_l	A->Y (RF)	0.02206	0.51034	7.16904
	B->Y (RF)	0.02496	0.49473	6.83017

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00382	0.00409	0.00335
	B	0.00000	0.00000	0.00000
	B	0.00478	0.00447	0.00750
sky130_osu_sc_15T_hs__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00294	0.00306	0.00443
	B	0.00000	0.00000	0.00000
	B	0.00377	0.00375	0.00519

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00035	0.00058
	B	0.00000	0.00000	0.00000
	B	-0.00042	-0.00047	0.00011
sky130_osu_sc_15T_hs__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00029	-0.00032	0.00020
	B	0.00000	0.00000	0.00000
	B	-0.00027	-0.00032	0.00002

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00263	-0.00265	-0.00265
sky130_osu_sc_15T_hs__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00184	-0.00186	-0.00186

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00264	0.00268	0.00265
sky130_osu_sc_15T_hs__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00186	0.00188	0.00186

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00244	-0.00246	-0.00244
sky130_osu_sc_15T_hs__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00169	-0.00171	-0.00169

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00250	0.00249	0.00245
sky130_osu_sc_15T_hs__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00173	0.00173	0.00170

SKY130_OSU_SC_15T_HS__NOR2x

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__nor2_1	7.93650
sky130_osu_sc_15T_hs__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__nor2_1	0.00345	0.00374	1.03464
sky130_osu_sc_15T_hs__nor2_l	0.00266	0.00298	0.60793

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__nor2_1	0.00000	0.00478	0.01252
sky130_osu_sc_15T_hs__nor2_l	0.00000	0.00544	0.01397

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__nor2_1	A->Y (FR)	0.04799	0.82680	11.38230
	B->Y (FR)	0.03670	0.79892	11.17510
sky130_osu_sc_15T_hs__nor2_l	A->Y (FR)	0.06217	0.96684	11.55820
	B->Y (FR)	0.05201	0.93940	11.39190

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__nor2_1	A->Y (RF)	0.02159	0.38234	5.17811
	B->Y (RF)	0.01718	0.37364	5.16269
sky130_osu_sc_15T_hs__nor2_l	A->Y (RF)	0.01978	0.35475	4.17154
	B->Y (RF)	0.01727	0.34541	4.15968

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00505	0.00501	0.00595
	B	0.00000	0.00000	0.00000
	B	0.00388	0.00403	0.00776
sky130_osu_sc_15T_hs__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00369	0.00363	0.00415
	B	0.00000	0.00000	0.00000
	B	0.00300	0.00297	0.00510

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00059	0.00048	0.00208
	B	0.00000	0.00000	0.00000
	B	-0.00056	-0.00045	0.00109
sky130_osu_sc_15T_hs__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00035	0.00026	0.00104
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00024	0.00044

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00198	-0.00230	-0.00230
sky130_osu_sc_15T_hs__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00134	-0.00153	-0.00152

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00229	0.00232	0.00230
sky130_osu_sc_15T_hs__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00152	0.00153	0.00152

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00117	-0.00118	-0.00117
sky130_osu_sc_15T_hs__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00079	-0.00080	-0.00079

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00123	0.00124	0.00119
sky130_osu_sc_15T_hs__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00083	0.00083	0.00080

SKY130_OSU_SC_15T_HS__OAI21

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_hs__oai21_l	0.00350	0.00358	0.00297	0.99024

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__oai21_l	0.00000	0.00804	0.02649

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__oai21_l	A0->Y (FR)	0.05108	0.81737	11.12190
	A1->Y (FR)	0.06590	0.84972	11.34230
	B0->Y (FR)	0.03651	0.74955	10.51480

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__oai21_l	A0->Y (RF)	0.03085	0.45496	6.04548
	A1->Y (RF)	0.03604	0.45201	5.92264
	B0->Y (RF)	0.02415	0.48006	6.57446

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00533	0.00549	0.00880
	A1	0.00000	0.00000	0.00000
	A1	0.00652	0.00642	0.00731
	B0	0.00436	0.00431	0.00608

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00021	0.00015	0.00098
	A1	0.00000	0.00000	0.00000
	A1	0.00137	0.00118	0.00202
	B0	0.00062	0.00063	0.00147

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00118	-0.00119	-0.00118
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00226	-0.00234	-0.00233
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00237	-0.00239	-0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00123	0.00124	0.00119
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00231	0.00234	0.00233
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00238	0.00239	0.00238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00192	-0.00223	-0.00225
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00224	-0.00229	-0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00233	-0.00234	-0.00233

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00223	0.00223	0.00225
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00229	0.00229	0.00230
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00235	0.00236	0.00234

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00187	-0.00189	-0.00191

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00190	0.00195	0.00191

SKY130_OSU_SC_15T_HS__OAI22

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__oai22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_hs__oai22_l	0.00337	0.00359	0.00370	0.00360	1.01325

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__oai22_l	0.00000	0.00705	0.02504

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__oai22_l	A0->Y (FR)	0.06938	0.84396	11.28050
	A1->Y (FR)	0.05782	0.81503	11.07510
	B0->Y (FR)	0.04018	0.79836	11.07060
	B1->Y (FR)	0.05374	0.82882	11.27880

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__oai22_l	A0->Y (RF)	0.05044	0.48628	6.19681
	A1->Y (RF)	0.04076	0.47194	6.15392
	B0->Y (RF)	0.03433	0.49738	6.69196
	B1->Y (RF)	0.04446	0.51399	6.79533

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	A0	0.00839	0.00831	0.00913
	A1	0.00717	0.00722	0.01053
	B0	0.00411	0.00420	0.00779
	B1	0.00661	0.00651	0.00734

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	A0	0.00216	0.00198	0.00276
	A1	-0.00016	-0.00022	0.00062
	B0	-0.00018	-0.00012	0.00131
	B1	0.00095	0.00083	0.00224

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00198	-0.00230	-0.00230
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00197	-0.00230	-0.00230
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00225	-0.00231	-0.00231
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00234	-0.00235	-0.00234

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00229	0.00231	0.00230
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00229	0.00231	0.00230
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00230	0.00232	0.00231
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00234	0.00237	0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00116	-0.00117	-0.00116
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00116	-0.00117	-0.00116
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00222	-0.00229	-0.00228
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00232	-0.00233	-0.00232

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00122	0.00123	0.00118
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00122	0.00123	0.00118
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00227	0.00229	0.00228
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00232	0.00235	0.00233

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00115	-0.00117	-0.00115
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00115	-0.00117	-0.00115
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00250	-0.00257	-0.00256
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00255	-0.00257	-0.00260

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00120	0.00122	0.00117
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00120	0.00122	0.00117
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00256	0.00258	0.00256
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00259	0.00265	0.00261

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00194	-0.00225	-0.00225
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00194	-0.00225	-0.00225
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00256	-0.00263	-0.00262
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00260	-0.00263	-0.00266

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00224	0.00226	0.00225
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00224	0.00225	0.00225
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00263	0.00265	0.00262
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00266	0.00271	0.00266

SKY130_OSU_SC_15T_HS__OR2x

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__or2_1	10.37850
sky130_osu_sc_15T_hs__or2_2	12.82050
sky130_osu_sc_15T_hs__or2_4	17.70450
sky130_osu_sc_15T_hs__or2_8	27.47250
sky130_osu_sc_15T_hs__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__or2_1	0.00381	0.00358	1.97298
sky130_osu_sc_15T_hs__or2_2	0.00381	0.00358	3.89023
sky130_osu_sc_15T_hs__or2_4	0.00382	0.00358	7.47896
sky130_osu_sc_15T_hs__or2_8	0.00382	0.00359	14.15545
sky130_osu_sc_15T_hs__or2_l	0.00307	0.00281	1.06547

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__or2_1	0.00000	0.00888	0.01510
sky130_osu_sc_15T_hs__or2_2	0.00000	0.01298	0.02762
sky130_osu_sc_15T_hs__or2_4	0.00000	0.02117	0.05266
sky130_osu_sc_15T_hs__or2_8	0.00000	0.03756	0.10274
sky130_osu_sc_15T_hs__or2_l	0.00000	0.00938	0.01517

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__or2_1	A->Y (RR)	0.05243	0.47102	5.80615
	B->Y (RR)	0.04625	0.45007	5.88838
sky130_osu_sc_15T_hs__or2_2	A->Y (RR)	0.05773	0.40992	5.86029
	B->Y (RR)	0.05128	0.39114	5.92002
sky130_osu_sc_15T_hs__or2_4	A->Y (RR)	0.07597	0.40323	6.10406
	B->Y (RR)	0.06940	0.38777	6.12936
sky130_osu_sc_15T_hs__or2_8	A->Y (RR)	0.11038	0.44354	6.40101
	B->Y (RR)	0.10389	0.43129	6.39725
sky130_osu_sc_15T_hs__or2_l	A->Y (RR)	0.05783	0.57365	5.59657
	B->Y (RR)	0.05337	0.55561	5.59883

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__or2_1	A->Y (FF)	0.08578	0.57998	6.74740
	B->Y (FF)	0.07001	0.54316	6.72241
sky130_osu_sc_15T_hs__or2_2	A->Y (FF)	0.10134	0.56352	6.89366
	B->Y (FF)	0.08564	0.53185	6.82898
sky130_osu_sc_15T_hs__or2_4	A->Y (FF)	0.14109	0.59860	7.20358
	B->Y (FF)	0.12546	0.57307	7.06893
sky130_osu_sc_15T_hs__or2_8	A->Y (FF)	0.22339	0.68927	7.49843
	B->Y (FF)	0.20782	0.66622	7.29124
sky130_osu_sc_15T_hs__or2_l	A->Y (FF)	0.10769	0.58403	5.37167
	B->Y (FF)	0.08953	0.55068	5.26043

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	A	0.00000	0.00000	0.00000
	A	0.00392	0.00355	0.01457
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00311	0.02145
sky130_osu_sc_15T_hs__or2_2	A	0.00000	0.00000	0.00000
	A	0.00665	0.00650	0.01748
	B	0.00000	0.00000	0.00000
	B	0.00552	0.00597	0.02431
sky130_osu_sc_15T_hs__or2_4	A	0.00000	0.00000	0.00000
	A	0.01263	0.01290	0.02561
	B	0.00000	0.00000	0.00000
	B	0.01150	0.01254	0.03059
sky130_osu_sc_15T_hs__or2_8	A	0.00000	0.00000	0.00000
	A	0.02498	0.02571	0.03819
	B	0.00000	0.00000	0.00000
	B	0.02378	0.02535	0.04269
sky130_osu_sc_15T_hs__or2_l	A	0.00000	0.00000	0.00000
	A	0.00291	0.00257	0.00735
	B	0.00000	0.00000	0.00000
	B	0.00226	0.00223	0.00912

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	A	0.00000	0.00000	0.00000
	A	0.00856	0.00836	0.01690
	B	0.00000	0.00000	0.00000
	B	0.00712	0.00804	0.03135
sky130_osu_sc_15T_hs__or2_2	A	0.00000	0.00000	0.00000
	A	0.01052	0.01064	0.01877
	B	0.00000	0.00000	0.00000
	B	0.00908	0.01013	0.03238
sky130_osu_sc_15T_hs__or2_4	A	0.00000	0.00000	0.00000
	A	0.01588	0.01607	0.02378
	B	0.00000	0.00000	0.00000
	B	0.01439	0.01535	0.03578
sky130_osu_sc_15T_hs__or2_8	A	0.00000	0.00000	0.00000
	A	0.02894	0.02680	0.03431
	B	0.00000	0.00000	0.00000
	B	0.02784	0.02612	0.04411
sky130_osu_sc_15T_hs__or2_l	A	0.00000	0.00000	0.00000
	A	0.00662	0.00632	0.01033
	B	0.00000	0.00000	0.00000
	B	0.00566	0.00596	0.01594

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00232	-0.00232
sky130_osu_sc_15T_hs__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00232	-0.00232
sky130_osu_sc_15T_hs__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00232	-0.00232
sky130_osu_sc_15T_hs__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00200	-0.00232	-0.00232
sky130_osu_sc_15T_hs__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00136	-0.00154	-0.00154

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00231	0.00233	0.00232
sky130_osu_sc_15T_hs__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00231	0.00233	0.00232
sky130_osu_sc_15T_hs__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00231	0.00234	0.00232
sky130_osu_sc_15T_hs__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00231	0.00234	0.00232
sky130_osu_sc_15T_hs__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00154	0.00155	0.00154

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00117	-0.00119	-0.00118
sky130_osu_sc_15T_hs__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00117	-0.00119	-0.00118
sky130_osu_sc_15T_hs__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00117	-0.00119	-0.00118
sky130_osu_sc_15T_hs__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00117	-0.00119	-0.00118
sky130_osu_sc_15T_hs__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00080	-0.00081	-0.00081

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00123	0.00125	0.00119
sky130_osu_sc_15T_hs__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00123	0.00125	0.00119
sky130_osu_sc_15T_hs__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00123	0.00125	0.00119
sky130_osu_sc_15T_hs__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00123	0.00125	0.00120
sky130_osu_sc_15T_hs__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00085	0.00086	0.00082

SKY130_OSU_SC_15T_HS__TBUFIx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__tbufi_1	10.37850
sky130_osu_sc_15T_hs__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_hs__tbufi_1	0.00372	0.00474	1.02280
sky130_osu_sc_15T_hs__tbufi_l	0.00298	0.00393	0.60531

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__tbufi_1	0.00000	0.00738	0.02504
sky130_osu_sc_15T_hs__tbufi_l	0.00000	0.00755	0.02794

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__tbufi_1	A->Y (FR)	0.03485	0.78906	11.02760
	OE->Y (FR)	0.03638	0.29053	4.59496
	OE->Y (RR)	0.06309	0.57013	6.08013
sky130_osu_sc_15T_hs__tbufi_l	A->Y (FR)	0.04998	0.93702	11.37240
	OE->Y (FR)	0.04433	0.29076	4.59477
	OE->Y (RR)	0.07330	0.70162	5.96208

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__tbufi_1	A->Y (RF)	0.02150	0.44951	6.21769
	OE->Y (FF)	0.03700	0.29053	4.59496
	OE->Y (RF)	0.02113	0.44119	6.05767
sky130_osu_sc_15T_hs__tbufi_l	A->Y (RF)	0.02171	0.41635	5.02321
	OE->Y (FF)	0.04469	0.29076	4.59476
	OE->Y (RF)	0.02154	0.39979	4.74692

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00366	0.00379	0.00724
	OE	0.00000	0.00000	0.00000
	OE	0.00365	0.00399	0.02883
sky130_osu_sc_15T_hs__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00282	0.00277	0.00472
	OE	0.00000	0.00000	0.00000
	OE	0.00260	0.00254	0.01349

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00056	-0.00048	0.00092
	OE	0.00000	0.00000	0.00000
	OE	0.00249	0.00283	0.03116
sky130_osu_sc_15T_hs__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00032	-0.00025	0.00037
	OE	0.00000	0.00000	0.00000
	OE	0.00168	0.00162	0.01443

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00195	-0.00198	-0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00177	-0.00179	-0.00178
sky130_osu_sc_15T_hs__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00143	-0.00145	-0.00143
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00132	-0.00133	-0.00132

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00195	0.00198	0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00181	0.00183	0.00180
sky130_osu_sc_15T_hs__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00143	0.00145	0.00143
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00134	0.00135	0.00133

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00144	0.00192	0.03091
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00130	0.00174	0.03075
sky130_osu_sc_15T_hs__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00095	0.00092	0.01396
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00086	0.00081	0.01386

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00439	0.00506	0.03389
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00444	0.00518	0.03396
sky130_osu_sc_15T_hs__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00348	0.00364	0.01676
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00354	0.00372	0.01682

SKY130_OSU_SC_15T_HS__TNBUFIx

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__tnbufi_1	10.37850
sky130_osu_sc_15T_hs__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_hs__tnbufi_1	0.00372	0.00569	1.04961
sky130_osu_sc_15T_hs__tnbufi_l	0.00297	0.00424	0.60533

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__tnbufi_1	0.00000	0.01112	0.01381
sky130_osu_sc_15T_hs__tnbufi_l	0.00000	0.01201	0.01457

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__tnbufi_1	A->Y (FR)	0.03529	0.79691	11.20470
	OE->Y (RR)	0.02042	0.29079	4.59534
	OE->Y (FR)	0.04564	0.82414	11.41490
sky130_osu_sc_15T_hs__tnbufi_l	A->Y (FR)	0.05033	0.93682	11.37240
	OE->Y (RR)	0.02003	0.29078	4.59536
	OE->Y (FR)	0.05940	0.96368	11.54260

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_hs__tnbufi_1	A->Y (RF)	0.02112	0.45384	6.32682
	OE->Y (RF)	0.02015	0.29079	4.59532
	OE->Y (FF)	0.04057	0.45380	5.20496
sky130_osu_sc_15T_hs__tnbufi_l	A->Y (RF)	0.02126	0.41592	5.02345
	OE->Y (RF)	0.01990	0.29078	4.59539
	OE->Y (FF)	0.04823	0.45374	4.32103

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00378	0.00391	0.00734
	OE	0.00000	0.00000	0.00000
	OE	0.00910	0.01022	0.03947
sky130_osu_sc_15T_hs__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00295	0.00290	0.00485
	OE	0.00000	0.00000	0.00000
	OE	0.00685	0.00729	0.02062

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00072	-0.00063	0.00074
	OE	0.00000	0.00000	0.00000
	OE	0.00810	0.00938	0.03318
sky130_osu_sc_15T_hs__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00048	-0.00040	0.00022
	OE	0.00000	0.00000	0.00000
	OE	0.00606	0.00656	0.01797

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00163	-0.00166	-0.00164
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00147	-0.00149	-0.00148
sky130_osu_sc_15T_hs__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00112	-0.00114	-0.00113
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00103	-0.00103	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00163	0.00166	0.00164
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00150	0.00152	0.00149
sky130_osu_sc_15T_hs__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00112	0.00114	0.00113
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00105	0.00105	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00265	-0.00237	0.02711
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00261	-0.00233	0.02714
sky130_osu_sc_15T_hs__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00168	-0.00187	0.01144
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00165	-0.00182	0.01146

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_hs__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00690	0.00817	0.03756
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00680	0.00826	0.03750
sky130_osu_sc_15T_hs__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00519	0.00566	0.01909
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00512	0.00568	0.01905

SKY130_OSU_SC_15T_HS__XNOR2

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__xnor2_l	0.00738	0.00647	1.07149

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__xnor2_l	0.00000	0.02311	0.03885

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__xnor2_l	A->Y (RR)	B	0.07860	0.60713	6.38050
	A->Y (FR)	!B	0.04451	0.80736	11.27220
	B->Y (RR)	A	0.06185	0.58825	6.38817
	B->Y (FR)	!A	0.06061	0.83828	11.48950

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__xnor2_l	A->Y (FF)	B	0.06785	0.51173	5.48317
	A->Y (RF)	!B	0.02954	0.45598	6.25069
	B->Y (FF)	A	0.06061	0.50484	5.48484
	B->Y (RF)	!A	0.03578	0.46491	6.25293

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00352	0.00365	0.02851
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00888	0.00972	0.04154
	B	A	0.00000	0.00000	0.00000
	B	A	0.00129	0.00173	0.03095
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00959	0.01032	0.03939

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01139	0.01180	0.03975
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00259	0.00281	0.03177
	B	A	0.00000	0.00000	0.00000
	B	A	0.01025	0.01129	0.03999
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00350	0.00366	0.03241

SKY130_OSU_SC_15T_HS__XOR2

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__xor2_1	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_hs__xor2_1	0.00740	0.00652	1.03290

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__xor2_1	0.00000	0.02311	0.03264

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__xor2_l	A->Y (RR)	!B	0.07588	0.59306	6.26423
	A->Y (FR)	B	0.05819	0.83530	11.40730
	B->Y (RR)	!A	0.06572	0.59189	6.28618
	B->Y (FR)	A	0.06182	0.83840	11.38770

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_hs__xor2_l	A->Y (FF)	!B	0.06315	0.50713	5.25936
	A->Y (RF)	B	0.02951	0.46559	6.26635
	B->Y (FF)	!A	0.05845	0.50025	5.36901
	B->Y (RF)	A	0.03582	0.46070	6.11114

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01060	0.01135	0.04066
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00176	0.00135	0.02939
	B	A	0.00000	0.00000	0.00000
	B	A	0.01071	0.01151	0.04020
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00115	0.00151	0.03053

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_hs__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00230	0.00235	0.03217
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01174	0.01263	0.03595
	B	A	0.00000	0.00000	0.00000
	B	A	0.00232	0.00238	0.03086
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01043	0.01147	0.04003

SKY130_OSU_SC_15T_HS_x

sky130_osu_sc_15T_hs_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_hs__ant	5.49450
sky130_osu_sc_15T_hs__tiehi	5.49450
sky130_osu_sc_15T_hs__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_hs__ant	0.54316
sky130_osu_sc_15T_hs__tiehi	0.00000
sky130_osu_sc_15T_hs__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_hs__ant	0.00000	207621.00000	415242.00000
sky130_osu_sc_15T_hs__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_hs__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_hs__ant	0.00000	0.00000	0.00000
	-0.00150	0.04297	0.67656

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_hs__ant	0.00000	0.00000	0.00000
	3.61384	3.44422	0.83500