sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs Library

Cell Groups
SKY130_OSU_SC_12T_LS__ADDFx
SKY130_OSU_SC_12T_LS__ADDHx
SKY130_OSU_SC_12T_LS__AND2x
SKY130_OSU_SC_12T_LS__AOI21
SKY130_OSU_SC_12T_LS__AOI22
SKY130_OSU_SC_12T_LS__BUFx
SKY130_OSU_SC_12T_LS__DFFRx
SKY130_OSU_SC_12T_LS__DFFSRx
SKY130_OSU_SC_12T_LS__DFFSx
SKY130_OSU_SC_12T_LS__DFFx
SKY130_OSU_SC_12T_LS__INVx
SKY130_OSU_SC_12T_LS__MUX2
SKY130_OSU_SC_12T_LS__NAND2x
SKY130_OSU_SC_12T_LS__NOR2x
SKY130_OSU_SC_12T_LS__OAI21
SKY130_OSU_SC_12T_LS__OAI22
SKY130_OSU_SC_12T_LS__OR2x
SKY130_OSU_SC_12T_LS__TBUFIx
SKY130_OSU_SC_12T_LS__TNBUFIx
SKY130_OSU_SC_12T_LS__XNOR2
SKY130_OSU_SC_12T_LS__XOR2
SKY130_OSU_SC_12T_LS_x

SKY130_OSU_SC_12T_LS__ADDFx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__addf_1	31.25760
sky130_osu_sc_12T_ls__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ls__addf_1	0.01007	0.01012	0.00798	0.11328	0.03905	0.10925
sky130_osu_sc_12T_ls__addf_l	0.01007	0.01012	0.00799	0.07889	0.03963	0.11016

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__addf_1	0.00000	0.00028	0.00030
sky130_osu_sc_12T_ls__addf_l	0.00000	0.00027	0.00030

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CO (RR)	0.72817	3.22780	18.66870
	B->CO (RR)	0.70475	3.16617	18.54510
	CI->CO (RR)	0.70373	3.20497	18.79380
	CON->CO (FR)	0.24798	1.95619	14.29530
sky130_osu_sc_12T_ls__addf_1	A->CO (RR)	0.75625	3.22973	17.03420
	B->CO (RR)	0.73419	3.17969	17.01790
	CI->CO (RR)	0.73169	3.20890	17.17910
	CON->CO (FR)	0.30717	2.17822	14.31950

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CO (FF)	2.82749	8.73165	42.21320
	B->CO (FF)	2.64632	8.45644	41.55010
	CI->CO (FF)	2.62630	8.46707	41.72600
	CON->CO (RF)	0.05426	0.73883	7.01517
sky130_osu_sc_12T_ls__addf_1	A->CO (FF)	2.75651	7.76401	33.27770
	B->CO (FF)	2.57879	7.50478	32.76500
	CI->CO (FF)	2.55694	7.49807	32.77620
	CON->CO (RF)	0.06574	0.78634	7.13444

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CON (FR)	1.94523	3.98216	15.09100
	B->CON (FR)	1.79121	3.78843	14.82320
	CI->CON (FR)	1.74429	3.71533	14.54980
sky130_osu_sc_12T_ls__addf_1	A->CON (FR)	1.85708	3.90696	15.09650
	B->CON (FR)	1.70468	3.71438	14.82800
	CI->CON (FR)	1.65587	3.63979	14.55530

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CON (RF)	0.25770	0.92000	6.31105
	B->CON (RF)	0.24453	0.90306	6.31105
	CI->CON (RF)	0.23308	0.89913	6.33924
sky130_osu_sc_12T_ls__addf_1	A->CON (RF)	0.24699	0.91121	6.31297
	B->CON (RF)	0.23416	0.89464	6.31396
	CI->CON (RF)	0.22237	0.89037	6.34219

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->S (-R)	3.62276	9.80070	43.05600
	B->S (-R)	3.45303	9.56750	42.53940
	CI->S (-R)	3.41107	9.52122	42.52740
	CON->S (RR)	0.47985	2.14606	11.86180
sky130_osu_sc_12T_ls__addf_1	A->S (-R)	3.45256	9.69267	43.21190
	B->S (-R)	3.29007	9.45261	42.68330
	CI->S (-R)	3.24267	9.41235	42.66650
	CON->S (RR)	0.48000	2.15293	11.92340

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->S (-F)	1.90179	3.50582	13.70610
	B->S (-F)	2.13188	3.68489	13.61720
	CI->S (-F)	1.87556	3.47932	13.81160
	CON->S (FF)	1.06405	1.88756	9.30638
sky130_osu_sc_12T_ls__addf_l	A->S (-F)	1.87569	3.48600	13.73480
	B->S (-F)	2.10616	3.66547	13.64520
	CI->S (-F)	1.84908	3.45869	13.84330
	CON->S (FF)	1.06424	1.88885	9.31625

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00135	0.00134	0.00130
	B	0.00149	0.00154	0.00148
	CI	0.00160	0.00164	0.00159
sky130_osu_sc_12T_ls__addf_l	A	0.00121	0.00120	0.00115
	B	0.00135	0.00139	0.00133
	CI	0.00145	0.00149	0.00143

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00431	0.00430	0.00428
	B	0.00428	0.00428	0.00423
	CI	0.00372	0.00377	0.00373
sky130_osu_sc_12T_ls__addf_l	A	0.00419	0.00418	0.00414
	B	0.00416	0.00415	0.00410
	CI	0.00360	0.00363	0.00360

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00431	0.00429	0.00427
	B	0.00428	0.00426	0.00421
	CI	0.00372	0.00374	0.00371
sky130_osu_sc_12T_ls__addf_l	A	0.00419	0.00417	0.00414
	B	0.00416	0.00414	0.00408
	CI	0.00360	0.00362	0.00359

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00133	0.00132	0.00126
	B	0.00147	0.00151	0.00141
	CI	0.00161	0.00163	0.00159
sky130_osu_sc_12T_ls__addf_l	A	0.00119	0.00118	0.00108
	B	0.00133	0.00136	0.00124
	CI	0.00147	0.00149	0.00143

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00432	0.00431	0.00428
	B	0.00429	0.00428	0.00424
	CI	0.00373	0.00377	0.00374
sky130_osu_sc_12T_ls__addf_l	A	0.00420	0.00418	0.00416
	B	0.00417	0.00416	0.00412
	CI	0.00360	0.00365	0.00362

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00856	0.00859	0.00854
	B	0.00812	0.00806	0.00794
	CI	0.00703	0.00703	0.00699
sky130_osu_sc_12T_ls__addf_l	A	0.00857	0.00860	0.00855
	B	0.00813	0.00806	0.00794
	CI	0.00703	0.00703	0.00699

SKY130_OSU_SC_12T_LS__ADDHx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__addh_1	18.55920
sky130_osu_sc_12T_ls__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ls__addh_1	0.00489	0.00515	0.11266	0.11023	0.11316
sky130_osu_sc_12T_ls__addh_l	0.00489	0.00516	0.07698	0.11095	0.07780

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__addh_1	0.00000	0.00026	0.00030
sky130_osu_sc_12T_ls__addh_l	0.00000	0.00023	0.00028

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CO (RR)	0.57311	2.19357	11.87170
	B->CO (RR)	0.57798	2.19705	12.02590
sky130_osu_sc_12T_ls__addh_l	A->CO (RR)	0.60254	2.35754	11.66750
	B->CO (RR)	0.60753	2.36132	11.84140

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CO (FF)	0.81591	1.65142	9.14719
	B->CO (FF)	0.84795	1.69273	9.20161
sky130_osu_sc_12T_ls__addh_l	A->CO (FF)	0.78799	1.64275	9.10819
	B->CO (FF)	0.82050	1.68250	9.16704

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CON (RR)	0.93118	2.48852	11.94200
	B->CON (RR)	0.93562	2.49034	12.09000
sky130_osu_sc_12T_ls__addh_l	A->CON (RR)	0.86461	2.42943	11.85260
	B->CON (RR)	0.86970	2.43012	12.01710

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CON (FF)	0.92420	1.70311	9.16267
	B->CON (FF)	0.94883	1.74039	9.21273
sky130_osu_sc_12T_ls__addh_l	A->CON (FF)	0.84373	1.62463	9.04922
	B->CON (FF)	0.86956	1.65961	9.10304

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->S (FR)	1.32123	3.46118	18.07560
	B->S (FR)	1.34737	3.49696	18.12210
	CON->S (FR)	0.24944	1.93670	14.31970
sky130_osu_sc_12T_ls__addh_l	A->S (FR)	1.28223	3.47864	17.06460
	B->S (FR)	1.30798	3.51185	17.11970
	CON->S (FR)	0.30316	2.13629	14.19260

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->S (RF)	1.35297	4.11416	19.80560
	B->S (RF)	1.35710	4.11564	19.95800
	CON->S (RF)	0.05361	0.73344	7.02421
sky130_osu_sc_12T_ls__addh_l	A->S (RF)	1.29517	3.67683	15.83260
	B->S (RF)	1.29974	3.67753	15.98960
	CON->S (RF)	0.06446	0.78501	7.12085

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00222	0.00220	0.00212
	B	0.00000	0.00000	0.00000
	B	0.00212	0.00209	0.00202
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00195	0.00191	0.00183
	B	0.00000	0.00000	0.00000
	B	0.00185	0.00181	0.00173

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00311	0.00308	0.00291
	B	0.00000	0.00000	0.00000
	B	0.00323	0.00326	0.00310
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00283	0.00280	0.00267
	B	0.00000	0.00000	0.00000
	B	0.00296	0.00297	0.00286

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00223	0.00220	0.00212
	B	0.00000	0.00000	0.00000
	B	0.00212	0.00209	0.00202
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00196	0.00191	0.00183
	B	0.00000	0.00000	0.00000
	B	0.00185	0.00181	0.00173

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00310	0.00308	0.00291
	B	0.00000	0.00000	0.00000
	B	0.00323	0.00326	0.00311
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00283	0.00279	0.00263
	B	0.00000	0.00000	0.00000
	B	0.00296	0.00297	0.00282

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00311	0.00309	0.00306
	B	0.00000	0.00000	0.00000
	B	0.00324	0.00327	0.00325
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00283	0.00281	0.00276
	B	0.00000	0.00000	0.00000
	B	0.00296	0.00298	0.00296

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00222	0.00220	0.00212
	B	0.00000	0.00000	0.00000
	B	0.00212	0.00209	0.00202
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00195	0.00191	0.00183
	B	0.00000	0.00000	0.00000
	B	0.00185	0.00181	0.00173

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.04934	0.04607	0.00823
sky130_osu_sc_12T_ls__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.04935	0.04609	0.00824

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.04929	0.04576	0.00753
sky130_osu_sc_12T_ls__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.04929	0.04576	0.00754

SKY130_OSU_SC_12T_LS__AND2x

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__and2_1	8.30280
sky130_osu_sc_12T_ls__and2_2	10.25640
sky130_osu_sc_12T_ls__and2_4	14.16360
sky130_osu_sc_12T_ls__and2_6	18.07080
sky130_osu_sc_12T_ls__and2_8	21.97800
sky130_osu_sc_12T_ls__and2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__and2_1	0.00265	0.00273	0.11556
sky130_osu_sc_12T_ls__and2_2	0.00265	0.00273	0.23199
sky130_osu_sc_12T_ls__and2_4	0.00265	0.00273	0.45934
sky130_osu_sc_12T_ls__and2_6	0.00268	0.00272	0.66575
sky130_osu_sc_12T_ls__and2_8	0.00265	0.00272	0.87800
sky130_osu_sc_12T_ls__and2_l	0.00200	0.00205	0.07891

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__and2_1	0.00000	0.00011	0.00014
sky130_osu_sc_12T_ls__and2_2	0.00000	0.00016	0.00018
sky130_osu_sc_12T_ls__and2_4	0.00000	0.00026	0.00027
sky130_osu_sc_12T_ls__and2_6	0.00000	0.00036	0.00038
sky130_osu_sc_12T_ls__and2_8	0.00000	0.00046	0.00049
sky130_osu_sc_12T_ls__and2_l	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__and2_1	A->Y (RR)	0.45469	2.07863	11.59470
	B->Y (RR)	0.46651	2.08646	11.82910
sky130_osu_sc_12T_ls__and2_2	A->Y (RR)	0.46384	1.84343	11.93750
	B->Y (RR)	0.47616	1.85129	12.11460
sky130_osu_sc_12T_ls__and2_4	A->Y (RR)	0.61713	1.81316	12.51930
	B->Y (RR)	0.62930	1.82515	12.62080
sky130_osu_sc_12T_ls__and2_6	A->Y (RR)	0.78098	1.89237	12.76670
	B->Y (RR)	0.79293	1.90492	12.81020
sky130_osu_sc_12T_ls__and2_8	A->Y (RR)	0.93934	2.01024	13.11060
	B->Y (RR)	0.95164	2.02684	13.11620
sky130_osu_sc_12T_ls__and2_l	A->Y (RR)	0.51709	2.28537	11.61200
	B->Y (RR)	0.52929	2.29882	11.84110

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__and2_1	**A->Y (FF)**	0.59336	1.39091	8.71314
	B->Y (FF)	0.63461	1.43538	8.80148
sky130_osu_sc_12T_ls__and2_2	**A->Y (FF)**	0.76749	1.57047	9.07040
	B->Y (FF)	0.80515	1.60895	9.14265
sky130_osu_sc_12T_ls__and2_4	**A->Y (FF)**	1.15516	1.98188	9.64838
	B->Y (FF)	1.18410	2.01996	9.69911
sky130_osu_sc_12T_ls__and2_6	**A->Y (FF)**	1.54954	2.41319	10.14750
	B->Y (FF)	1.56983	2.43992	10.17260
sky130_osu_sc_12T_ls__and2_8	**A->Y (FF)**	1.92330	2.82349	10.62980
	B->Y (FF)	1.93552	2.83333	10.64480
sky130_osu_sc_12T_ls__and2_l	**A->Y (FF)**	0.63566	1.45686	8.68336
	B->Y (FF)	0.68935	1.50919	8.78180

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00165	0.00160	0.00150
	B	0.00000	0.00000	0.00000
	B	0.00169	0.00164	0.00155
sky130_osu_sc_12T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.00297	0.00301	0.00291
	B	0.00000	0.00000	0.00000
	B	0.00301	0.00304	0.00297
sky130_osu_sc_12T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.00604	0.00620	0.00616
	B	0.00000	0.00000	0.00000
	B	0.00607	0.00626	0.00621
sky130_osu_sc_12T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.00908	0.00940	0.00939
	B	0.00000	0.00000	0.00000
	B	0.00912	0.00946	0.00947
sky130_osu_sc_12T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.01211	0.01251	0.01260
	B	0.00000	0.00000	0.00000
	B	0.01215	0.01256	0.01269
sky130_osu_sc_12T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00127	0.00123	0.00116
	B	0.00000	0.00000	0.00000
	B	0.00129	0.00126	0.00118

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00389	0.00382	0.00374
	B	0.00000	0.00000	0.00000
	B	0.00433	0.00425	0.00418
sky130_osu_sc_12T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.00490	0.00497	0.00489
	B	0.00000	0.00000	0.00000
	B	0.00534	0.00540	0.00532
sky130_osu_sc_12T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.00742	0.00772	0.00769
	B	0.00000	0.00000	0.00000
	B	0.00786	0.00814	0.00811
sky130_osu_sc_12T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.01002	0.01051	0.01061
	B	0.00000	0.00000	0.00000
	B	0.01043	0.01092	0.01100
sky130_osu_sc_12T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.01246	0.01310	0.01336
	B	0.00000	0.00000	0.00000
	B	0.01290	0.01351	0.01378
sky130_osu_sc_12T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00291	0.00285	0.00280
	B	0.00000	0.00000	0.00000
	B	0.00320	0.00315	0.00309

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00125	-0.00126	-0.00126
sky130_osu_sc_12T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00125	-0.00126	-0.00126
sky130_osu_sc_12T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00125	-0.00126	-0.00126
sky130_osu_sc_12T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00126	-0.00128	-0.00127
sky130_osu_sc_12T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00125	-0.00126	-0.00126
sky130_osu_sc_12T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00087	-0.00088	-0.00088

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00127	0.00127	0.00126
sky130_osu_sc_12T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00127	0.00127	0.00126
sky130_osu_sc_12T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00127	0.00127	0.00126
sky130_osu_sc_12T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00128	0.00128	0.00128
sky130_osu_sc_12T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00127	0.00127	0.00126
sky130_osu_sc_12T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00088	0.00088	0.00088

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00119	-0.00119	-0.00119
sky130_osu_sc_12T_ls__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00119	-0.00119	-0.00119
sky130_osu_sc_12T_ls__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00119	-0.00120	-0.00119
sky130_osu_sc_12T_ls__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00119	-0.00119	-0.00119
sky130_osu_sc_12T_ls__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00119	-0.00120	-0.00119
sky130_osu_sc_12T_ls__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00083	-0.00084	-0.00083

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00119	0.00120	0.00119
sky130_osu_sc_12T_ls__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00119	0.00120	0.00119
sky130_osu_sc_12T_ls__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00119	0.00120	0.00119
sky130_osu_sc_12T_ls__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00119	0.00120	0.00119
sky130_osu_sc_12T_ls__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00119	0.00120	0.00119
sky130_osu_sc_12T_ls__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00083	0.00084	0.00084

SKY130_OSU_SC_12T_LS__AOI21

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ls__aoi21_l	0.00232	0.00251	0.00255	0.04439

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__aoi21_l	0.00000	0.00006	0.00008

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi21_l	A0->Y (FR)	0.94280	3.14985	15.09390
	A1->Y (FR)	0.80727	2.94824	14.72150
	B0->Y (FR)	0.81912	2.92968	14.64820

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi21_l	A0->Y (RF)	0.11904	0.79409	6.27717
	A1->Y (RF)	0.11064	0.78659	6.27902
	B0->Y (RF)	0.07698	0.72947	6.26620

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00279	0.00275	0.00273
	A1	0.00000	0.00000	0.00000
	A1	0.00241	0.00236	0.00232
	B0	0.00249	0.00242	0.00234

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00029	0.00025	0.00018
	A1	0.00000	0.00000	0.00000
	A1	0.00030	0.00025	0.00018
	B0	-0.00021	-0.00020	-0.00025

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00097	-0.00099	-0.00099
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00102	-0.00102	-0.00102
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00102	-0.00103	-0.00102

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00098	0.00099	0.00099
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00102	0.00103	0.00103
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00102	0.00103	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00097	-0.00100	-0.00099
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00102	-0.00103	-0.00103
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00113	-0.00114	-0.00114

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00098	0.00100	0.00099
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00102	0.00103	0.00103
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00114	0.00115	0.00114

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00065	-0.00066	-0.00065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00070	0.00070	0.00066

SKY130_OSU_SC_12T_LS__AOI22

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__aoi22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ls__aoi22_1	0.00232	0.00250	0.00271	0.00250	0.04341

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__aoi22_1	0.00000	0.00009	0.00011

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi22_l	A0->Y (FR)	1.19392	3.38827	15.23300
	A1->Y (FR)	1.07498	3.24841	15.06640
	B0->Y (FR)	0.88004	2.95542	14.51060
	B1->Y (FR)	0.99961	3.10605	14.69440

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi22_l	A0->Y (RF)	0.14291	0.81641	6.29280
	A1->Y (RF)	0.13450	0.80945	6.29514
	B0->Y (RF)	0.10559	0.77327	6.21527
	B1->Y (RF)	0.11405	0.78139	6.22103

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	A0	0.00343	0.00339	0.00336
	A1	0.00305	0.00299	0.00295
	B0	0.00267	0.00258	0.00243
	B1	0.00306	0.00300	0.00292

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	A0	0.00073	0.00070	0.00061
	A1	0.00074	0.00070	0.00061
	B0	-0.00008	-0.00007	-0.00012
	B1	-0.00008	-0.00007	-0.00012

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00097	-0.00099	-0.00098
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00102	-0.00102	-0.00102
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00102	-0.00103	-0.00102
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00102	-0.00103	-0.00102

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00098	0.00099	0.00098
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00102	0.00103	0.00103
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00102	0.00103	0.00103
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00102	0.00103	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00098	-0.00099	-0.00099
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00102	-0.00103	-0.00103
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00113	-0.00113	-0.00114
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00113	-0.00113	-0.00114

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00098	0.00099	0.00099
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00102	0.00103	0.00103
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00114	0.00114	0.00114
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00114	0.00114	0.00114

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00065	-0.00066	-0.00065
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00065	-0.00065	-0.00065
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00119	-0.00120	-0.00120
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00119	-0.00120	-0.00120

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00067	0.00067	0.00065
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00065	0.00065	0.00065
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00119	0.00121	0.00120
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00119	0.00121	0.00120

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00066	-0.00066	-0.00066
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00066	-0.00066	-0.00066
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00108	-0.00109	-0.00109
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00108	-0.00109	-0.00109

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00068	0.00068	0.00066
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00066	0.00066	0.00066
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00108	0.00109	0.00109
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00108	0.00109	0.00109

SKY130_OSU_SC_12T_LS__BUFx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__buf_1	6.34920
sky130_osu_sc_12T_ls__buf_2	8.30280
sky130_osu_sc_12T_ls__buf_4	12.21000
sky130_osu_sc_12T_ls__buf_6	16.11720
sky130_osu_sc_12T_ls__buf_8	20.02440
sky130_osu_sc_12T_ls__buf_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ls__buf_1	0.00276	0.10979
sky130_osu_sc_12T_ls__buf_2	0.00276	0.22958
sky130_osu_sc_12T_ls__buf_4	0.00275	0.45278
sky130_osu_sc_12T_ls__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ls__buf_8	0.00276	0.90677
sky130_osu_sc_12T_ls__buf_l	0.00204	0.07649

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__buf_1	0.00000	0.00009	0.00009
sky130_osu_sc_12T_ls__buf_2	0.00000	0.00013	0.00014
sky130_osu_sc_12T_ls__buf_4	0.00000	0.00022	0.00026
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ls__buf_8	0.00000	0.00040	0.00048
sky130_osu_sc_12T_ls__buf_l	0.00000	0.00007	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__buf_1	**A->Y (RR)**	0.35291	1.97802	11.23600
sky130_osu_sc_12T_ls__buf_2	**A->Y (RR)**	0.31294	1.71347	11.71610
sky130_osu_sc_12T_ls__buf_4	**A->Y (RR)**	0.38558	1.59383	12.13070
sky130_osu_sc_12T_ls__buf_8	**A->Y (RR)**	0.55677	1.62740	12.84540
sky130_osu_sc_12T_ls__buf_l	**A->Y (RR)**	0.40826	2.16422	11.21920

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__buf_1	**A->Y (FF)**	0.56570	1.35311	8.59741
sky130_osu_sc_12T_ls__buf_2	**A->Y (FF)**	0.73790	1.53314	9.01116
sky130_osu_sc_12T_ls__buf_4	**A->Y (FF)**	1.12816	1.95315	9.60473
sky130_osu_sc_12T_ls__buf_8	**A->Y (FF)**	1.90007	2.79725	10.63390
sky130_osu_sc_12T_ls__buf_l	**A->Y (FF)**	0.61952	1.43048	8.60239

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00158	0.00149	0.00137
sky130_osu_sc_12T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00289	0.00288	0.00276
sky130_osu_sc_12T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.00597	0.00609	0.00602
sky130_osu_sc_12T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.01207	0.01243	0.01245
sky130_osu_sc_12T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00122	0.00116	0.00107

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00388	0.00378	0.00371
sky130_osu_sc_12T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00484	0.00488	0.00481
sky130_osu_sc_12T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.00738	0.00764	0.00761
sky130_osu_sc_12T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.01245	0.01305	0.01330
sky130_osu_sc_12T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00293	0.00286	0.00281

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
	-0.00033	-0.00033	-0.00032

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
	0.00033	0.00033	0.00032

SKY130_OSU_SC_12T_LS__DFFRx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__dffr_1	42.49080
sky130_osu_sc_12T_ls__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ls__dffr_1	0.00245	0.00251	0.00836	0.11387	0.11202
sky130_osu_sc_12T_ls__dffr_l	0.00245	0.00251	0.00836	0.07662	0.07640

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dffr_1	0.00000	0.00044	0.00052
sky130_osu_sc_12T_ls__dffr_l	0.00000	0.00042	0.00050

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->Q (RR)	3.46787	5.66896	17.24690
	QN->Q (FR)	0.26080	2.02347	14.73530
sky130_osu_sc_12T_ls__dffr_l	CK->Q (RR)	3.36810	5.70262	16.72360
	QN->Q (FR)	0.31140	2.16949	14.28790

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->Q (RF)	2.82079	5.62307	21.38120
	QN->Q (RF)	0.05852	0.76528	7.31984
	RN->Q (FF)	1.86931	4.78237	23.31560
sky130_osu_sc_12T_ls__dffr_l	CK->Q (RF)	2.93605	6.04195	21.21200
	QN->Q (RF)	0.06877	0.79776	7.28153
	RN->Q (FF)	1.98590	5.20045	23.14660

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->QN (RR)	2.50507	4.12275	13.65260
	RN->QN (FR)	1.55066	3.27781	15.60370
sky130_osu_sc_12T_ls__dffr_l	CK->QN (RR)	2.54811	4.30188	13.53340
	RN->QN (FR)	1.59325	3.45801	15.48590

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	**CK->QN (RF)**	2.97587	3.82652	8.35948
sky130_osu_sc_12T_ls__dffr_l	**CK->QN (RF)**	2.83680	3.68388	8.17319

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.25383	-0.27365	-1.26634
	setup	CK (R)	2.57834	2.57816	3.04856
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.25714	-0.27642	-1.26844
	setup	CK (R)	2.58538	2.58621	3.06643

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-1.47979	-1.89978	-14.74550
	setup	CK (R)	1.64072	2.06807	14.90620
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-1.48000	-1.89995	-14.74680
	setup	CK (R)	1.63836	2.06738	14.90650

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.25383	-0.27365	-1.26634
	setup	CK (R)	2.57834	2.57816	3.04856
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.25714	-0.27642	-1.26844
	setup	CK (R)	2.58538	2.58621	3.06643

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-1.47979	-1.89978	-14.74550
	setup	CK (R)	1.64072	2.06807	14.90620
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-1.48000	-1.89995	-14.74680
	setup	CK (R)	1.63836	2.06738	14.90650

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	recovery	CK (R)	2.50204	2.49582	2.78443
	removal	CK (R)	-0.36252	-0.40435	-0.24463
sky130_osu_sc_12T_ls__dffr_l	recovery	CK (R)	2.51219	2.51504	2.79693
	removal	CK (R)	-0.36252	-0.40435	-0.24463

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	recovery	CK (R)	2.50204	2.49582	2.78443
	removal	CK (R)	-0.36252	-0.40435	-0.24463
sky130_osu_sc_12T_ls__dffr_l	recovery	CK (R)	2.51219	2.51504	2.79693
	removal	CK (R)	-0.36252	-0.40435	-0.24463

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	min_pulse_width	RN ()	1.23765	1.52730	14.70410
	min_pulse_width	RN ()	1.24350	1.52730	14.70080
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	RN ()	1.24528	1.51874	14.67150
	min_pulse_width	RN ()	1.24935	1.51659	14.67150

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	min_pulse_width	CK ()	1.51235	1.68359	13.33370
	min_pulse_width	CK ()	1.61991	1.46093	13.33370
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	CK ()	1.35742	1.53372	13.33370
	min_pulse_width	CK ()	1.59456	1.44166	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_12T_ls__dffr_1	min_pulse_width	CK ()	3.42238	3.45848	13.98470
	min_pulse_width	CK ()	1.38363	1.74568	13.76990
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	CK ()	3.42967	3.47133	14.00750
	min_pulse_width	CK ()	1.38028	1.74568	13.76990

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00380	0.00374	0.00335
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00339	0.00331	0.00304

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00424	0.00420	0.00404
	RN	-0.00057	-0.00800	-0.04664
	RN	0.00938	0.00936	0.00919
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00382	0.00376	0.00363
	RN	-0.00057	-0.00631	-0.03138
	RN	0.00895	0.00893	0.00878

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00425	0.00420	0.00404
	RN	-0.00057	-0.00792	-0.04589
	RN	0.00938	0.00937	0.00919
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00382	0.00377	0.00363
	RN	-0.00057	-0.00630	-0.03129
	RN	0.00895	0.00893	0.00878

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00379	0.00372	0.00314
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00338	0.00330	0.00288

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00098	-0.00101	-0.00100
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00425	0.00418	0.00405
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00161	0.00156	0.00145
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00098	-0.00101	-0.00100
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00425	0.00418	0.00405
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00161	0.00156	0.00145

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00099	0.00101	0.00100
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00651	0.00645	0.00626
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00315	0.00308	0.00301
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00099	0.00101	0.00100
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00651	0.00645	0.00626
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00315	0.00308	0.00301

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00153	0.00147	0.00136
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00442	0.00428	0.00409
sky130_osu_sc_12T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00153	0.00147	0.00136
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00442	0.00428	0.00409

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00371	0.00359	0.00355
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00727	0.00716	0.00703
sky130_osu_sc_12T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00371	0.00359	0.00355
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00727	0.00716	0.00703

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00026	-0.00035	-0.00048
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00212	0.00201	0.00169
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00022	-0.00033	-0.00048
sky130_osu_sc_12T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00026	-0.00035	-0.00048
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00212	0.00201	0.00169
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00022	-0.00033	-0.00048

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00611	0.00592	0.00584
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01146	0.01134	0.00896
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00875	0.00864	0.00845
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01149	0.01122	0.01095
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00630	0.00612	0.00602
sky130_osu_sc_12T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00611	0.00592	0.00584
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01146	0.01134	0.00896
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00875	0.00864	0.00845
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01149	0.01122	0.01095
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00630	0.00612	0.00602

SKY130_OSU_SC_12T_LS__DFFSRx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__dffsr_1	46.39800
sky130_osu_sc_12T_ls__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ls__dffsr_1	0.00241	0.00253	0.00571	0.00841	0.11495	0.11314
sky130_osu_sc_12T_ls__dffsr_l	0.00241	0.00253	0.00572	0.00841	0.07788	0.07622

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ls__dffsr_1	0.00000	0.00047	0.00055
sky130_osu_sc_12T_ls__dffsr_l	0.00000	0.00045	0.00053

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RR)	3.21617	5.39189	17.12370
	QN->Q (FR)	0.25316	1.99492	14.60720
	RN->Q (RR)	2.75805	4.96235	16.80700
	SN->Q (FR)	2.80106	5.07107	19.54400
sky130_osu_sc_12T_ls__dffsr_l	CK->Q (RR)	3.18312	5.52506	16.85640
	QN->Q (FR)	0.31034	2.17215	14.41240
	RN->Q (RR)	2.72947	5.09589	16.54980
	SN->Q (FR)	2.77266	5.20431	19.29020

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RF)	3.12462	5.94406	21.71710
	QN->Q (RF)	0.05826	0.76564	7.33368
	RN->Q (FF)	2.00649	4.90882	23.46260
sky130_osu_sc_12T_ls__dffsr_l	CK->Q (RF)	3.24962	6.40447	21.79570
	QN->Q (RF)	0.06844	0.79944	7.30752
	RN->Q (FF)	2.13756	5.38080	23.55510

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->QN (RR)	2.80661	4.44148	13.98180
	RN->QN (FR)	1.69253	3.40783	15.74610
sky130_osu_sc_12T_ls__dffsr_l	CK->QN (RR)	2.85440	4.63139	13.86920
	RN->QN (FR)	1.74562	3.60612	15.64070

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->QN (RF)	2.77224	3.60349	8.26681
	RN->QN (RF)	2.30441	3.17678	7.96488
	SN->QN (FF)	2.34591	3.28440	10.70140
sky130_osu_sc_12T_ls__dffsr_l	CK->QN (RF)	2.69030	3.52225	8.13971
	RN->QN (RF)	2.22251	3.10244	7.84163
	SN->QN (FF)	2.26468	3.21052	10.57930

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.29638	-0.29123	-1.39352
	setup	CK (R)	2.38932	2.36400	2.74622
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.29613	-0.29206	-1.39411
	setup	CK (R)	2.38770	2.36945	2.74991

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-1.69318	-2.09332	-14.99360
	setup	CK (R)	1.86165	2.23672	15.09720
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-1.69636	-2.09364	-14.99350
	setup	CK (R)	1.85451	2.23550	15.09710

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.29638	-0.29123	-1.39352
	setup	CK (R)	2.38932	2.36400	2.74622
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.29613	-0.29206	-1.39411
	setup	CK (R)	2.38770	2.36945	2.74991

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-1.69318	-2.09332	-14.99360
	setup	CK (R)	1.86165	2.23672	15.09720
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-1.69636	-2.09364	-14.99350
	setup	CK (R)	1.85451	2.23550	15.09710

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	2.18670	2.16026	2.34907
	removal	CK (R)	-0.23376	-0.27264	-0.18616
	hold	SN (R)	-2.29069	-2.53551	-12.66020
	setup	SN (R)	2.33510	2.59540	13.34060
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	2.18264	2.16222	2.34724
	removal	CK (R)	-0.23646	-0.27277	-0.19021
	hold	SN (R)	-2.14153	-2.38400	-12.54900
	setup	SN (R)	2.31277	2.54504	13.24910

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	2.18670	2.16026	2.34907
	removal	CK (R)	-0.23376	-0.27264	-0.18616
	hold	SN (R)	-2.30432	-2.53855	-12.66020
	hold	SN (R)	-2.29069	-2.53551	-12.66610
	setup	SN (R)	2.33510	2.58726	13.31980
	setup	SN (R)	2.32548	2.59540	13.34060
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	2.18264	2.16222	2.34724
	removal	CK (R)	-0.23646	-0.27277	-0.19021
	hold	SN (R)	-2.25585	-2.46597	-12.54900
	hold	SN (R)	-2.14153	-2.38400	-12.54960
	setup	SN (R)	2.31277	2.54504	13.19670
	setup	SN (R)	2.17843	2.47904	13.24910

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	RN ()	1.41608	1.67289	14.92870
	min_pulse_width	RN ()	1.41929	1.67289	14.92870
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	RN ()	1.45509	1.67717	14.90270
	min_pulse_width	RN ()	1.44818	1.67289	14.90270

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.10125	0.10621	0.73073
	removal	CK (R)	-0.01449	-0.03912	-0.52117
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.09855	0.10268	0.72982
	removal	CK (R)	-0.01449	-0.03912	-0.52117

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.10125	0.10621	0.73073
	removal	CK (R)	-0.01449	-0.03912	-0.52117
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.09855	0.10268	0.72982
	removal	CK (R)	-0.01449	-0.03912	-0.52117

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	SN ()	2.30106	2.64490	15.95400
	min_pulse_width	SN ()	2.36174	2.66203	15.94100
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	SN ()	2.28165	2.56354	15.79780
	min_pulse_width	SN ()	2.21611	2.54642	15.83360

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	CK ()	1.37901	1.53158	13.33370
	min_pulse_width	CK ()	1.75927	1.61722	13.33370
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	CK ()	1.27656	1.42667	13.33370
	min_pulse_width	CK ()	1.73954	1.60009	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_12T_ls__dffsr_1	min_pulse_width	CK ()	3.25491	3.26793	14.04980
	min_pulse_width	CK ()	1.61813	1.92553	14.07910
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	CK ()	3.25491	3.27221	14.04980
	min_pulse_width	CK ()	1.61443	1.92553	14.07910

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00449	0.00446	0.00404
	RN	0.00850	0.00844	0.00809
	SN	-0.00057	-0.00804	-0.04708
	SN	0.00910	0.00903	0.00871
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00410	0.00406	0.00377
	RN	0.00811	0.00804	0.00780
	SN	-0.00057	-0.00637	-0.03190
	SN	0.00870	0.00863	0.00844

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00473	0.00471	0.00456
	RN	-0.00057	-0.00804	-0.04708
	RN	0.00999	0.00998	0.00982
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00432	0.00429	0.00415
	RN	-0.00057	-0.00637	-0.03190
	RN	0.00957	0.00955	0.00939

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00474	0.00472	0.00457
	RN	-0.00057	-0.00797	-0.04634
	RN	0.00999	0.00998	0.00982
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00433	0.00430	0.00415
	RN	-0.00057	-0.00629	-0.03122
	RN	0.00958	0.00955	0.00940

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00448	0.00444	0.00384
	RN	0.00848	0.00842	0.00786
	SN	-0.00057	-0.00797	-0.04634
	SN	0.00908	0.00901	0.00849
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00409	0.00404	0.00360
	RN	0.00809	0.00802	0.00762
	SN	-0.00057	-0.00629	-0.03122
	SN	0.00868	0.00861	0.00826

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00099	-0.00102	-0.00101
	(!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)	0.00521	0.00516	0.00504
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00177	0.00172	0.00161
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00175	0.00171	0.00160
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00178	0.00173	0.00162
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00099	-0.00102	-0.00101
	(!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)	0.00521	0.00516	0.00504
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00177	0.00172	0.00161
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00175	0.00171	0.00160
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00178	0.00173	0.00162

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00100	0.00102	0.00101
	(!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)	0.00734	0.00728	0.00671
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00352	0.00346	0.00333
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00354	0.00348	0.00335
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00351	0.00345	0.00332
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00100	0.00102	0.00101
	(!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)	0.00734	0.00728	0.00671
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00352	0.00346	0.00333
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00354	0.00348	0.00335
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00351	0.00345	0.00332

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__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)	0.00149	0.00143	0.00127
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00527	0.00515	0.00490
sky130_osu_sc_12T_ls__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)	0.00149	0.00143	0.00127
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00527	0.00515	0.00490

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__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)	0.00414	0.00402	0.00398
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00781	0.00769	0.00754
sky130_osu_sc_12T_ls__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)	0.00414	0.00402	0.00398
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00781	0.00769	0.00754

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__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)	-0.00267	-0.00268	-0.00268
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00288	-0.00292	-0.00290
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00268	-0.00272	-0.00269
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00084	0.00078	0.00061
sky130_osu_sc_12T_ls__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)	-0.00267	-0.00268	-0.00268
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00288	-0.00292	-0.00290
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00268	-0.00272	-0.00269
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00084	0.00078	0.00061

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__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)	0.00269	0.00273	0.00269
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00289	0.00294	0.00290
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00268	0.00273	0.00269
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00601	0.00591	0.00522
sky130_osu_sc_12T_ls__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)	0.00269	0.00273	0.00269
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00289	0.00294	0.00290
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00268	0.00273	0.00269
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00601	0.00591	0.00522

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00029	-0.00038	-0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00260	0.00251	0.00220
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00257	0.00248	0.00216
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00015	-0.00026	-0.00041
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00158	0.00143	0.00116
sky130_osu_sc_12T_ls__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00029	-0.00038	-0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00260	0.00251	0.00220
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00257	0.00249	0.00216
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00015	-0.00026	-0.00041
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00158	0.00143	0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_12T_ls__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01259	0.01248	0.00958
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00622	0.00603	0.00595
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00888	0.00874	0.00860
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00888	0.00878	0.00862
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01236	0.01208	0.01168
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00630	0.00612	0.00602
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00817	0.00785	0.00768
sky130_osu_sc_12T_ls__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01259	0.01248	0.00958
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00622	0.00603	0.00595
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00888	0.00874	0.00860
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00888	0.00878	0.00862
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01236	0.01209	0.01168
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00630	0.00612	0.00602
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00817	0.00785	0.00768

SKY130_OSU_SC_12T_LS__DFFSx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__dffs_1	38.58360
sky130_osu_sc_12T_ls__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ls__dffs_1	0.00243	0.00495	0.00833	0.11201	0.11199
sky130_osu_sc_12T_ls__dffs_l	0.00243	0.00491	0.00833	0.07783	0.07632

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dffs_1	0.00000	0.00040	0.00044
sky130_osu_sc_12T_ls__dffs_l	0.00000	0.00038	0.00042

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->Q (RR)	1.87445	3.95530	15.37620
	QN->Q (FR)	0.26118	2.00955	14.59370
	SN->Q (FR)	1.68865	3.87090	18.22760
sky130_osu_sc_12T_ls__dffs_l	CK->Q (RR)	1.87280	4.14482	15.34820
	QN->Q (FR)	0.31140	2.19093	14.39920
	SN->Q (FR)	1.69281	4.06287	18.18390

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->Q (RF)	3.00499	5.78311	21.32990
	QN->Q (RF)	0.05825	0.76114	7.28345
sky130_osu_sc_12T_ls__dffs_l	CK->Q (RF)	3.10174	6.23432	21.60120
	QN->Q (RF)	0.06856	0.79906	7.30299

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->QN (RR)	2.68336	4.30207	13.83320
sky130_osu_sc_12T_ls__dffs_l	CK->QN (RR)	2.70772	4.46060	13.69290

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->QN (RF)	1.48825	2.23882	6.72362
	SN->QN (FF)	1.28385	2.16841	9.56230
sky130_osu_sc_12T_ls__dffs_l	CK->QN (RF)	1.43798	2.19831	6.66573
	SN->QN (FF)	1.23577	2.13035	9.50649

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.19927	-0.20332	-1.19644
	setup	CK (R)	1.31123	1.30329	1.89505
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.19912	-0.20409	-1.19520
	setup	CK (R)	1.31094	1.29892	1.89327

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-1.53567	-1.95217	-14.82860
	setup	CK (R)	1.79822	2.14913	14.98780
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-1.53670	-1.95196	-14.82960
	setup	CK (R)	1.79014	2.14833	14.99130

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.19927	-0.20332	-1.19644
	setup	CK (R)	1.31123	1.30329	1.89505
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.19912	-0.20409	-1.19520
	setup	CK (R)	1.31094	1.29892	1.89327

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-1.53567	-1.95217	-14.82860
	setup	CK (R)	1.79822	2.14913	14.98780
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-1.53670	-1.95196	-14.82960
	setup	CK (R)	1.79014	2.14833	14.99130

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	recovery	CK (R)	0.17599	0.18377	1.18475
	removal	CK (R)	-0.05362	-0.08650	-0.84058
sky130_osu_sc_12T_ls__dffs_l	recovery	CK (R)	0.16987	0.18278	1.18230
	removal	CK (R)	-0.05362	-0.08650	-0.84156

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	recovery	CK (R)	0.17599	0.18377	1.18475
	removal	CK (R)	-0.05362	-0.08650	-0.84058
sky130_osu_sc_12T_ls__dffs_l	recovery	CK (R)	0.16987	0.18278	1.18230
	removal	CK (R)	-0.05362	-0.08650	-0.84156

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	min_pulse_width	SN ()	1.23946	1.84631	15.07840
	min_pulse_width	SN ()	1.27023	1.82918	15.08490
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	SN ()	1.20900	1.76495	14.97430
	min_pulse_width	SN ()	1.18558	1.77566	14.98730

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	min_pulse_width	CK ()	0.47395	0.81435	13.33370
	min_pulse_width	CK ()	1.63013	1.47163	13.33370
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	CK ()	0.45043	0.79936	13.33370
	min_pulse_width	CK ()	1.60417	1.44808	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_12T_ls__dffs_1	min_pulse_width	CK ()	2.16779	2.19101	14.00100
	min_pulse_width	CK ()	1.55509	1.83346	13.91640
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	CK ()	2.16357	2.19101	14.00100
	min_pulse_width	CK ()	1.54804	1.83346	13.91640

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00379	0.00373	0.00327
	SN	-0.00057	-0.00792	-0.04588
	SN	0.00795	0.00791	0.00751
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00337	0.00330	0.00300
	SN	-0.00057	-0.00637	-0.03188
	SN	0.00753	0.00748	0.00721

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00424	0.00421	0.00406
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00382	0.00378	0.00364

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00425	0.00421	0.00405
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00383	0.00378	0.00364

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00378	0.00372	0.00308
	SN	-0.00057	-0.00792	-0.04587
	SN	0.00792	0.00789	0.00728
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00336	0.00329	0.00282
	SN	-0.00057	-0.00629	-0.03126
	SN	0.00750	0.00746	0.00703

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00100	-0.00104	-0.00103
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00421	0.00415	0.00397
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00160	0.00155	0.00144
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00100	-0.00104	-0.00103
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00421	0.00415	0.00397
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00160	0.00155	0.00144

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00102	0.00104	0.00103
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00665	0.00658	0.00633
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00322	0.00315	0.00308
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00102	0.00104	0.00103
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00665	0.00658	0.00633
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00322	0.00315	0.00308

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00196	-0.00197	-0.00197
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00135	0.00128	0.00119
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00196	-0.00197	-0.00197
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00135	0.00128	0.00119

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00196	0.00199	0.00197
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00432	0.00420	0.00412
sky130_osu_sc_12T_ls__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00196	0.00199	0.00197
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00432	0.00420	0.00412

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00026	-0.00035	-0.00048
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00018	-0.00029	-0.00044
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00146	0.00130	0.00105
sky130_osu_sc_12T_ls__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00026	-0.00035	-0.00048
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00018	-0.00029	-0.00044
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00146	0.00131	0.00105

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01148	0.01136	0.00996
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00612	0.00592	0.00584
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01159	0.01127	0.01102
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00626	0.00608	0.00599
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00774	0.00741	0.00728
sky130_osu_sc_12T_ls__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01148	0.01136	0.00996
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00612	0.00592	0.00584
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01159	0.01127	0.01102
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00626	0.00608	0.00599
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00774	0.00741	0.00728

SKY130_OSU_SC_12T_LS__DFFx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__dff_1	32.23440
sky130_osu_sc_12T_ls__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ls__dff_1	0.00259	0.00829	0.11266
sky130_osu_sc_12T_ls__dff_l	0.00259	0.00829	0.07613

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dff_1	0.00000	0.00039	0.00041
sky130_osu_sc_12T_ls__dff_l	0.00000	0.00037	0.00039

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dff_1	**CK->Q (RR)**	1.50859	3.14173	12.72460
sky130_osu_sc_12T_ls__dff_l	**CK->Q (RR)**	1.51406	3.27020	12.43540

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dff_1	**CK->Q (RF)**	2.65800	3.35965	8.01007
sky130_osu_sc_12T_ls__dff_l	**CK->Q (RF)**	2.71572	3.44432	8.07740

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	hold	CK (R)	-0.20873	-0.21295	-1.27478
	setup	CK (R)	0.94337	0.94650	1.73155
sky130_osu_sc_12T_ls__dff_l	hold	CK (R)	-0.20931	-0.21022	-1.27433
	setup	CK (R)	0.94394	0.94847	1.72757

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	hold	CK (R)	-1.51210	-1.94829	-14.84670
	setup	CK (R)	1.74621	2.18967	15.08330
sky130_osu_sc_12T_ls__dff_l	hold	CK (R)	-1.51327	-1.94970	-14.84890
	setup	CK (R)	1.74190	2.18910	15.08310

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	min_pulse_width	CK ()	0.40979	0.78437	13.33370
	min_pulse_width	CK ()	1.61710	1.46521	13.33370
sky130_osu_sc_12T_ls__dff_l	min_pulse_width	CK ()	0.39777	0.77795	13.33370
	min_pulse_width	CK ()	1.59929	1.45022	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_12T_ls__dff_1	**min_pulse_width**	**CK** ()	1.79246	1.84203	13.99450
	min_pulse_width	**CK** ()	1.46117	1.84845	14.01400
sky130_osu_sc_12T_ls__dff_l	**min_pulse_width**	**CK** ()	1.79261	1.83132	13.98470
	min_pulse_width	**CK** ()	1.46117	1.84845	14.01400

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00804	0.00787	0.00749
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00719	0.00700	0.00661

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00870	0.00864	0.00834
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00787	0.00777	0.00750

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00097	-0.00100	-0.00099
	!CK	0.00000	0.00000	0.00000
	!CK	0.00396	0.00389	0.00372
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00097	-0.00100	-0.00099
	!CK	0.00000	0.00000	0.00000
	!CK	0.00396	0.00389	0.00372

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00098	0.00100	0.00099
	!CK	0.00000	0.00000	0.00000
	!CK	0.00699	0.00690	0.00662
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00098	0.00100	0.00099
	!CK	0.00000	0.00000	0.00000
	!CK	0.00699	0.00690	0.00662

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00028	-0.00037	-0.00049
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00018	-0.00029	-0.00044
sky130_osu_sc_12T_ls__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00028	-0.00037	-0.00049
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00018	-0.00029	-0.00044

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00610	0.00591	0.00583
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01117	0.01107	0.01046
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01181	0.01150	0.01123
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00622	0.00604	0.00595
sky130_osu_sc_12T_ls__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00610	0.00591	0.00583
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01117	0.01107	0.01046
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01181	0.01150	0.01123
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00622	0.00604	0.00595

SKY130_OSU_SC_12T_LS__INVx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__inv_1	4.39560
sky130_osu_sc_12T_ls__inv_10	21.97800
sky130_osu_sc_12T_ls__inv_2	6.34920
sky130_osu_sc_12T_ls__inv_3	8.30280
sky130_osu_sc_12T_ls__inv_4	10.25640
sky130_osu_sc_12T_ls__inv_6	14.16360
sky130_osu_sc_12T_ls__inv_8	18.07080
sky130_osu_sc_12T_ls__inv_l	4.38570

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ls__inv_1	0.00256	0.11153
sky130_osu_sc_12T_ls__inv_10	0.02256	1.12068
sky130_osu_sc_12T_ls__inv_2	0.00471	0.22777
sky130_osu_sc_12T_ls__inv_3	0.00696	0.33791
sky130_osu_sc_12T_ls__inv_4	0.00915	0.45408
sky130_osu_sc_12T_ls__inv_6	0.01369	0.67942
sky130_osu_sc_12T_ls__inv_8	0.01813	0.90951
sky130_osu_sc_12T_ls__inv_l	0.00200	0.07658

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__inv_1	0.00000	0.00004	0.00006
sky130_osu_sc_12T_ls__inv_10	0.00000	0.00044	0.00056
sky130_osu_sc_12T_ls__inv_2	0.00000	0.00009	0.00011
sky130_osu_sc_12T_ls__inv_3	0.00000	0.00013	0.00017
sky130_osu_sc_12T_ls__inv_4	0.00000	0.00018	0.00022
sky130_osu_sc_12T_ls__inv_6	0.00000	0.00027	0.00033
sky130_osu_sc_12T_ls__inv_8	0.00000	0.00035	0.00045
sky130_osu_sc_12T_ls__inv_l	0.00000	0.00003	0.00003

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__inv_1	**A->Y (FR)**	0.25968	1.98105	14.44300
sky130_osu_sc_12T_ls__inv_10	**A->Y (FR)**	0.16857	1.22284	14.42260
sky130_osu_sc_12T_ls__inv_2	**A->Y (FR)**	0.17373	1.63634	14.43590
sky130_osu_sc_12T_ls__inv_3	**A->Y (FR)**	0.17294	1.50015	14.43980
sky130_osu_sc_12T_ls__inv_4	**A->Y (FR)**	0.15556	1.42756	14.43830
sky130_osu_sc_12T_ls__inv_6	**A->Y (FR)**	0.15430	1.32691	14.44200
sky130_osu_sc_12T_ls__inv_8	**A->Y (FR)**	0.15921	1.25914	14.48730
sky130_osu_sc_12T_ls__inv_l	**A->Y (FR)**	0.31894	2.16448	14.22290

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__inv_1	**A->Y (RF)**	0.05409	0.73700	6.98664
sky130_osu_sc_12T_ls__inv_10	**A->Y (RF)**	0.05472	0.61199	7.06379
sky130_osu_sc_12T_ls__inv_2	**A->Y (RF)**	0.04190	0.68461	7.01803
sky130_osu_sc_12T_ls__inv_3	**A->Y (RF)**	0.04346	0.66814	7.05163
sky130_osu_sc_12T_ls__inv_4	**A->Y (RF)**	0.04156	0.64963	7.05225
sky130_osu_sc_12T_ls__inv_6	**A->Y (RF)**	0.04490	0.63126	7.06498
sky130_osu_sc_12T_ls__inv_8	**A->Y (RF)**	0.04926	0.62046	7.08277
sky130_osu_sc_12T_ls__inv_l	**A->Y (RF)**	0.06623	0.78313	7.08342

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__inv_1	A	0.00000	0.00000	0.00000
	A	0.00194	0.00181	0.00185
sky130_osu_sc_12T_ls__inv_10	A	0.00000	0.00000	0.00000
	A	0.01599	0.01555	0.01574
sky130_osu_sc_12T_ls__inv_2	A	0.00000	0.00000	0.00000
	A	0.00332	0.00311	0.00321
sky130_osu_sc_12T_ls__inv_3	A	0.00000	0.00000	0.00000
	A	0.00513	0.00468	0.00497
sky130_osu_sc_12T_ls__inv_4	A	0.00000	0.00000	0.00000
	A	0.00652	0.00633	0.00634
sky130_osu_sc_12T_ls__inv_6	A	0.00000	0.00000	0.00000
	A	0.00971	0.00948	0.00949
sky130_osu_sc_12T_ls__inv_8	A	0.00000	0.00000	0.00000
	A	0.01286	0.01230	0.01262
sky130_osu_sc_12T_ls__inv_l	A	0.00000	0.00000	0.00000
	A	0.00152	0.00139	0.00144

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__inv_1	**A**	0.00000	0.00000	0.00000
	A	-0.00024	-0.00026	-0.00028
sky130_osu_sc_12T_ls__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.00426	-0.00441	-0.00433
sky130_osu_sc_12T_ls__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00086	-0.00089	-0.00091
sky130_osu_sc_12T_ls__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00105	-0.00111	-0.00113
sky130_osu_sc_12T_ls__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00168	-0.00175	-0.00177
sky130_osu_sc_12T_ls__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00250	-0.00262	-0.00262
sky130_osu_sc_12T_ls__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00337	-0.00351	-0.00347
sky130_osu_sc_12T_ls__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00017	-0.00018	-0.00020

SKY130_OSU_SC_12T_LS__MUX2

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ls__mux2_1	0.09080	0.09151	0.00528	0.10926

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__mux2_1	0.00000	0.00015	0.00017

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__mux2_1	A0->Y (RR)	-	0.12499	1.21053	10.16190
	A1->Y (RR)	-	0.15251	1.23472	10.18290
	S0->Y (RR)	(!A0 * A1)	0.24230	1.45883	10.24640
	S0->Y (FR)	(A0 * !A1)	0.26305	1.87539	12.06050

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__mux2_1	A0->Y (FF)	-	0.06458	0.73960	7.17033
	A1->Y (FF)	-	0.04852	0.72751	7.15074
	S0->Y (FF)	(!A0 * A1)	0.58580	1.35102	8.60234
	S0->Y (RF)	(A0 * !A1)	0.05769	0.73816	6.91533

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00191	-0.00191	-0.00191
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00130	-0.00130	-0.00130
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00274	0.00257	0.00252
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00113	-0.00122	-0.00133

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00191	0.00191	0.00191
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00130	0.00130	0.00130
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00043	0.00032	0.00022
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00508	0.00493	0.00487

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00053	-0.00053	-0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00053	0.00053	0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00064	-0.00063	-0.00063

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00064	0.00063	0.00063

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00035	-0.00047	-0.00056
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00035	-0.00044	-0.00056

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00397	0.00381	0.00377
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00385	0.00369	0.00364

SKY130_OSU_SC_12T_LS__NAND2x

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__nand2_1	6.34920
sky130_osu_sc_12T_ls__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__nand2_1	0.00254	0.00251	0.11101
sky130_osu_sc_12T_ls__nand2_l	0.00196	0.00197	0.07629

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__nand2_1	0.00000	0.00006	0.00011
sky130_osu_sc_12T_ls__nand2_l	0.00000	0.00004	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nand2_1	A->Y (FR)	0.27632	1.99816	14.42420
	B->Y (FR)	0.31509	2.00386	14.28730
sky130_osu_sc_12T_ls__nand2_l	A->Y (FR)	0.32503	2.15423	14.21160
	B->Y (FR)	0.37117	2.20302	14.26050

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nand2_1	A->Y (RF)	0.10025	0.93138	8.03172
	B->Y (RF)	0.10998	0.94607	7.93169
sky130_osu_sc_12T_ls__nand2_l	A->Y (RF)	0.11868	1.00634	8.08087
	B->Y (RF)	0.12829	1.02069	8.00305

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00204	0.00191	0.00194
	B	0.00000	0.00000	0.00000
	B	0.00244	0.00226	0.00235
sky130_osu_sc_12T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00151	0.00134	0.00144
	B	0.00000	0.00000	0.00000
	B	0.00179	0.00161	0.00172

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00010	-0.00013	-0.00014
	B	0.00000	0.00000	0.00000
	B	-0.00009	-0.00011	-0.00013
sky130_osu_sc_12T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00006	-0.00008	-0.00009
	B	0.00000	0.00000	0.00000
	B	-0.00006	-0.00007	-0.00009

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00120	-0.00121	-0.00121
sky130_osu_sc_12T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00084	-0.00085	-0.00085

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00121	0.00122	0.00121
sky130_osu_sc_12T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00085	0.00086	0.00085

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00111	-0.00112	-0.00111
sky130_osu_sc_12T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00079	-0.00079	-0.00079

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00111	0.00113	0.00111
sky130_osu_sc_12T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00079	0.00080	0.00079

SKY130_OSU_SC_12T_LS__NOR2x

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__nor2_1	6.34920
sky130_osu_sc_12T_ls__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__nor2_1	0.00244	0.00277	0.04586
sky130_osu_sc_12T_ls__nor2_l	0.00183	0.00209	0.03214

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__nor2_1	0.00000	0.00005	0.00007
sky130_osu_sc_12T_ls__nor2_l	0.00000	0.00004	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nor2_1	A->Y (FR)	0.74348	2.92655	14.87530
	B->Y (FR)	0.69063	2.77420	14.49790
sky130_osu_sc_12T_ls__nor2_l	A->Y (FR)	0.84762	3.18371	14.71870
	B->Y (FR)	0.80677	3.06006	14.33110

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nor2_1	A->Y (RF)	0.05979	0.65819	5.73275
	B->Y (RF)	0.05665	0.65546	5.71086
sky130_osu_sc_12T_ls__nor2_l	A->Y (RF)	0.07052	0.69439	5.84428
	B->Y (RF)	0.06785	0.69019	5.82381

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00238	0.00233	0.00231
	B	0.00000	0.00000	0.00000
	B	0.00213	0.00204	0.00191
sky130_osu_sc_12T_ls__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00172	0.00168	0.00167
	B	0.00000	0.00000	0.00000
	B	0.00158	0.00152	0.00149

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00008	0.00004	-0.00002
	B	0.00000	0.00000	0.00000
	B	-0.00021	-0.00021	-0.00026
sky130_osu_sc_12T_ls__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00007	0.00005	0.00001
	B	0.00000	0.00000	0.00000
	B	-0.00013	-0.00013	-0.00017

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00098	-0.00100	-0.00100
sky130_osu_sc_12T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00066	-0.00068	-0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00100	0.00101	0.00100
sky130_osu_sc_12T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00067	0.00068	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00066	-0.00066	-0.00065
sky130_osu_sc_12T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00045	-0.00045	-0.00045

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00066	0.00066	0.00065
sky130_osu_sc_12T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00045	0.00045	0.00045

SKY130_OSU_SC_12T_LS__OAI21

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ls__oai21_l	0.00251	0.00256	0.00224	0.04502

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__oai21_l	0.00000	0.00006	0.00009

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai21_l	A0->Y (FR)	0.92362	3.02892	14.62110
	A1->Y (FR)	1.01137	3.18592	15.03440
	B0->Y (FR)	0.41364	1.86545	11.41240

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai21_l	A0->Y (RF)	0.12714	0.80733	6.30173
	A1->Y (RF)	0.13687	0.81359	6.32093
	B0->Y (RF)	0.10807	0.78916	6.33494

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00269	0.00262	0.00246
	A1	0.00000	0.00000	0.00000
	A1	0.00300	0.00294	0.00291
	B0	0.00209	0.00196	0.00198

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00020	0.00019	0.00016
	A1	0.00000	0.00000	0.00000
	A1	0.00052	0.00048	0.00043
	B0	0.00073	0.00072	0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00066	-0.00066	-0.00066
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00101	-0.00102	-0.00102
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00106	-0.00106	-0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00066	0.00066	0.00066
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00101	0.00102	0.00102
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00106	0.00106	0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00094	-0.00097	-0.00096
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00099	-0.00102	-0.00101
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00104	-0.00105	-0.00105

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00096	0.00097	0.00096
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00101	0.00102	0.00101
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00104	0.00105	0.00105

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00087	-0.00088	-0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00091	0.00092	0.00091

SKY130_OSU_SC_12T_LS__OAI22

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ls__oai22_1	0.00230	0.00247	0.00268	0.00258	0.04568

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__oai22_1	0.00000	0.00009	0.00011

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai22_l	A0->Y (FR)	1.09899	3.27868	15.15840
	A1->Y (FR)	1.02264	3.10676	14.79770
	B0->Y (FR)	0.73201	2.79257	14.42580
	B1->Y (FR)	0.82415	2.98008	14.83400

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai22_l	A0->Y (RF)	0.16039	0.85215	6.39651
	A1->Y (RF)	0.14399	0.83227	6.36343
	B0->Y (RF)	0.12487	0.81262	6.39971
	B1->Y (RF)	0.14305	0.83229	6.44622

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	A0	0.00365	0.00359	0.00356
	A1	0.00332	0.00325	0.00310
	B0	0.00254	0.00246	0.00232
	B1	0.00289	0.00282	0.00278

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	A0	0.00061	0.00057	0.00051
	A1	0.00032	0.00033	0.00026
	B0	0.00031	0.00032	0.00025
	B1	0.00062	0.00058	0.00051

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00097	-0.00098	-0.00098
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00097	-0.00098	-0.00098
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00097	-0.00098	-0.00098
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00101	-0.00101	-0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00097	0.00099	0.00098
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00097	0.00099	0.00098
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00097	0.00099	0.00098
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00101	0.00103	0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00064	-0.00064	-0.00064
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00064	-0.00064	-0.00064
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00095	-0.00097	-0.00097
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00100	-0.00101	-0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00064	0.00065	0.00064
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00064	0.00065	0.00064
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00096	0.00097	0.00097
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00101	0.00102	0.00101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00064	-0.00065	-0.00065
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00064	-0.00065	-0.00065
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00115	-0.00116	-0.00116
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00114	-0.00115	-0.00119

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00065	0.00065	0.00065
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00065	0.00065	0.00065
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00115	0.00116	0.00116
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00120	0.00120	0.00120

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00096	-0.00097	-0.00097
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00096	-0.00097	-0.00097
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00117	-0.00119	-0.00119
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00117	-0.00118	-0.00122

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00096	0.00098	0.00097
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00096	0.00097	0.00097
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00119	0.00120	0.00119
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00123	0.00124	0.00122

SKY130_OSU_SC_12T_LS__OR2x

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__or2_1	8.30280
sky130_osu_sc_12T_ls__or2_2	10.25640
sky130_osu_sc_12T_ls__or2_4	14.16360
sky130_osu_sc_12T_ls__or2_8	21.97800
sky130_osu_sc_12T_ls__or2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__or2_1	0.00279	0.00262	0.11151
sky130_osu_sc_12T_ls__or2_2	0.00279	0.00262	0.22389
sky130_osu_sc_12T_ls__or2_4	0.00279	0.00262	0.44715
sky130_osu_sc_12T_ls__or2_8	0.00279	0.00261	0.88460
sky130_osu_sc_12T_ls__or2_l	0.00209	0.00198	0.07762

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__or2_1	0.00000	0.00009	0.00012
sky130_osu_sc_12T_ls__or2_2	0.00000	0.00013	0.00018
sky130_osu_sc_12T_ls__or2_4	0.00000	0.00021	0.00029
sky130_osu_sc_12T_ls__or2_8	0.00000	0.00036	0.00051
sky130_osu_sc_12T_ls__or2_l	0.00000	0.00008	0.00010

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__or2_1	A->Y (RR)	0.36706	2.01280	11.48640
	B->Y (RR)	0.35634	1.99776	11.38230
sky130_osu_sc_12T_ls__or2_2	A->Y (RR)	0.33068	1.72257	11.66230
	B->Y (RR)	0.31833	1.70873	11.57930
sky130_osu_sc_12T_ls__or2_4	A->Y (RR)	0.40309	1.61000	12.13380
	B->Y (RR)	0.39032	1.59580	12.07220
sky130_osu_sc_12T_ls__or2_8	A->Y (RR)	0.57324	1.63480	12.74900
	B->Y (RR)	0.56028	1.62403	12.69800
sky130_osu_sc_12T_ls__or2_l	A->Y (RR)	0.42854	2.22950	11.57100
	B->Y (RR)	0.41742	2.21326	11.48350

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__or2_1	A->Y (FF)	1.42076	2.26932	9.58560
	B->Y (FF)	1.28614	2.08248	9.24524
sky130_osu_sc_12T_ls__or2_2	A->Y (FF)	1.84600	2.74391	10.18820
	B->Y (FF)	1.71056	2.54696	9.83075
sky130_osu_sc_12T_ls__or2_4	A->Y (FF)	2.75640	3.75238	11.40470
	B->Y (FF)	2.62117	3.55243	11.03650
sky130_osu_sc_12T_ls__or2_8	A->Y (FF)	4.55757	5.72546	13.75570
	B->Y (FF)	4.42221	5.51232	13.36870
sky130_osu_sc_12T_ls__or2_l	A->Y (FF)	1.52216	2.40251	9.65372
	B->Y (FF)	1.38696	2.20728	9.28192

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00193	0.00187	0.00174
	B	0.00000	0.00000	0.00000
	B	0.00161	0.00157	0.00143
sky130_osu_sc_12T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.00327	0.00326	0.00315
	B	0.00000	0.00000	0.00000
	B	0.00293	0.00299	0.00285
sky130_osu_sc_12T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.00635	0.00647	0.00641
	B	0.00000	0.00000	0.00000
	B	0.00601	0.00619	0.00612
sky130_osu_sc_12T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.01247	0.01281	0.01286
	B	0.00000	0.00000	0.00000
	B	0.01213	0.01254	0.01262
sky130_osu_sc_12T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00148	0.00144	0.00134
	B	0.00000	0.00000	0.00000
	B	0.00125	0.00123	0.00112

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00433	0.00429	0.00424
	B	0.00000	0.00000	0.00000
	B	0.00386	0.00383	0.00379
sky130_osu_sc_12T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.00533	0.00540	0.00539
	B	0.00000	0.00000	0.00000
	B	0.00485	0.00494	0.00491
sky130_osu_sc_12T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.00780	0.00804	0.00820
	B	0.00000	0.00000	0.00000
	B	0.00732	0.00758	0.00770
sky130_osu_sc_12T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.01277	0.01324	0.01382
	B	0.00000	0.00000	0.00000
	B	0.01229	0.01278	0.01330
sky130_osu_sc_12T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00320	0.00317	0.00313
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00285	0.00282

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00100	-0.00102	-0.00101
sky130_osu_sc_12T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00100	-0.00102	-0.00101
sky130_osu_sc_12T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00099	-0.00102	-0.00101
sky130_osu_sc_12T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00099	-0.00102	-0.00101
sky130_osu_sc_12T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00067	-0.00069	-0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00101	0.00102	0.00101
sky130_osu_sc_12T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00101	0.00102	0.00101
sky130_osu_sc_12T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00101	0.00102	0.00101
sky130_osu_sc_12T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00101	0.00102	0.00101
sky130_osu_sc_12T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00069	0.00069	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00066	-0.00066	-0.00066
sky130_osu_sc_12T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00066	-0.00066	-0.00066
sky130_osu_sc_12T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00066	-0.00066	-0.00066
sky130_osu_sc_12T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00066	-0.00066	-0.00066
sky130_osu_sc_12T_ls__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00044	-0.00044	-0.00044

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00066
sky130_osu_sc_12T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00066
sky130_osu_sc_12T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00066
sky130_osu_sc_12T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00066	0.00066	0.00066
sky130_osu_sc_12T_ls__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00045	0.00044	0.00044

SKY130_OSU_SC_12T_LS__TBUFIx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__tbufi_1	8.30280
sky130_osu_sc_12T_ls__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ls__tbufi_1	0.00275	0.00356	0.04707
sky130_osu_sc_12T_ls__tbufi_l	0.00210	0.00270	0.03258

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__tbufi_1	0.00000	0.00007	0.00011
sky130_osu_sc_12T_ls__tbufi_l	0.00000	0.00006	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tbufi_1	A->Y (FR)	0.64334	2.73958	14.59120
	OE->Y (FR)	0.37513	0.94692	7.07943
	OE->Y (RR)	0.70286	2.78466	11.75440
sky130_osu_sc_12T_ls__tbufi_l	A->Y (FR)	0.77066	3.04465	14.39930
	OE->Y (FR)	0.39990	0.96333	6.97957
	OE->Y (RR)	0.81696	3.07389	11.77500

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tbufi_1	A->Y (RF)	0.09619	0.77410	6.32721
	OE->Y (FF)	0.37803	0.94475	7.08278
	OE->Y (RF)	0.09227	0.76911	6.30122
sky130_osu_sc_12T_ls__tbufi_l	A->Y (RF)	0.11519	0.82014	6.40337
	OE->Y (FF)	0.40174	0.96336	6.98365
	OE->Y (RF)	0.10867	0.81707	6.39024

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00195	0.00187	0.00181
	OE	0.00000	0.00000	0.00000
	OE	0.00171	0.00160	0.00151
sky130_osu_sc_12T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00146	0.00140	0.00136
	OE	0.00000	0.00000	0.00000
	OE	0.00126	0.00118	0.00111

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00021	-0.00021	-0.00026
	OE	0.00000	0.00000	0.00000
	OE	0.00128	0.00117	0.00107
sky130_osu_sc_12T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00013	-0.00013	-0.00016
	OE	0.00000	0.00000	0.00000
	OE	0.00089	0.00081	0.00074

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00099	-0.00100	-0.00099
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00096	-0.00096	-0.00095
sky130_osu_sc_12T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00071	-0.00071	-0.00071
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00068	-0.00068	-0.00067

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00099	0.00100	0.00099
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00096	0.00097	0.00096
sky130_osu_sc_12T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00071	0.00071	0.00071
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00068	0.00069	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00069	0.00058	0.00049
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00061	0.00050	0.00041
sky130_osu_sc_12T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00048	0.00040	0.00033
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00042	0.00034	0.00027

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00232	0.00216	0.00211
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00240	0.00225	0.00217
sky130_osu_sc_12T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00175	0.00163	0.00159
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00181	0.00170	0.00165

SKY130_OSU_SC_12T_LS__TNBUFIx

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__tnbufi_1	8.30280
sky130_osu_sc_12T_ls__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ls__tnbufi_1	0.00274	0.00397	0.04704
sky130_osu_sc_12T_ls__tnbufi_l	0.00200	0.00299	0.03237

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__tnbufi_1	0.00000	0.00008	0.00009
sky130_osu_sc_12T_ls__tnbufi_l	0.00000	0.00006	0.00007

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tnbufi_1	A->Y (FR)	0.64663	2.73708	14.55100
	OE->Y (RR)	0.06194	0.49272	3.77735
	OE->Y (FR)	0.63647	2.84713	14.89680
sky130_osu_sc_12T_ls__tnbufi_l	A->Y (FR)	0.75227	3.01477	14.32670
	OE->Y (RR)	0.07276	0.51894	3.77785
	OE->Y (FR)	0.74428	3.10880	14.68880

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tnbufi_1	A->Y (RF)	0.09277	0.77366	6.32522
	OE->Y (RF)	0.06117	0.49057	3.77727
	OE->Y (FF)	0.41999	1.20961	8.05099
sky130_osu_sc_12T_ls__tnbufi_l	A->Y (RF)	0.10701	0.81796	6.38645
	OE->Y (RF)	0.07197	0.51670	3.77783
	OE->Y (FF)	0.49256	1.29717	8.04161

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00203	0.00194	0.00180
	OE	0.00000	0.00000	0.00000
	OE	0.00454	0.00441	0.00438
sky130_osu_sc_12T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00150	0.00144	0.00141
	OE	0.00000	0.00000	0.00000
	OE	0.00346	0.00335	0.00331

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00031	-0.00030	-0.00035
	OE	0.00000	0.00000	0.00000
	OE	0.00416	0.00405	0.00401
sky130_osu_sc_12T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00023	-0.00023	-0.00026
	OE	0.00000	0.00000	0.00000
	OE	0.00314	0.00305	0.00301

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00083	-0.00084	-0.00083
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00079	-0.00079	-0.00079
sky130_osu_sc_12T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00056	-0.00056	-0.00056
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00053	-0.00054	-0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00083	0.00084	0.00083
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00080	0.00080	0.00080
sky130_osu_sc_12T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00056	0.00056	0.00056
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00054	0.00054	0.00054

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00115	-0.00128	-0.00139
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00109	-0.00123	-0.00135
sky130_osu_sc_12T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00077	-0.00088	-0.00096
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00074	-0.00085	-0.00094

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00351	0.00340	0.00336
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00345	0.00333	0.00329
sky130_osu_sc_12T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00269	0.00260	0.00256
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00265	0.00255	0.00252

SKY130_OSU_SC_12T_LS__XNOR2

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__xnor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__xnor2_l	0.00547	0.00455	0.04553

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__xnor2_l	0.00000	0.00018	0.00020

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xnor2_l	A->Y (RR)	B	0.94276	2.98720	11.85320
	A->Y (FR)	!B	0.85893	2.95245	14.59080
	B->Y (RR)	A	0.84249	2.88525	11.69840
	B->Y (FR)	!A	0.88727	3.05574	14.88130

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xnor2_l	A->Y (FF)	B	0.64522	1.43452	8.46765
	A->Y (RF)	!B	0.13362	0.80471	6.29366
	B->Y (FF)	A	0.62452	1.41506	8.44492
	B->Y (RF)	!A	0.13920	0.80882	6.31032

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00173	0.00161	0.00145
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00493	0.00471	0.00462
	B	A	0.00000	0.00000	0.00000
	B	A	0.00115	0.00104	0.00089
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00489	0.00472	0.00466

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00549	0.00537	0.00529
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00132	0.00122	0.00108
	B	A	0.00000	0.00000	0.00000
	B	A	0.00517	0.00511	0.00503
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00149	0.00135	0.00120

SKY130_OSU_SC_12T_LS__XOR2

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
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_12T_ls__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__xor2_l	0.00545	0.00459	0.04486

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__xor2_l	0.00000	0.00018	0.00019

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xor2_l	A->Y (RR)	!B	1.04584	3.09735	11.92520
	A->Y (FR)	B	0.86100	3.00836	14.79920
	B->Y (RR)	!A	0.86503	2.91347	11.72510
	B->Y (FR)	A	0.92772	3.10575	14.91560

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xor2_l	A->Y (FF)	!B	0.67854	1.45969	8.50107
	A->Y (RF)	B	0.11727	0.79324	6.30505
	B->Y (FF)	!A	0.64337	1.42910	8.44345
	B->Y (RF)	A	0.12411	0.79664	6.28813

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00547	0.00525	0.00516
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00127	0.00112	0.00093
	B	A	0.00000	0.00000	0.00000
	B	A	0.00541	0.00524	0.00518
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00105	0.00095	0.00080

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00096	0.00081	0.00064
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00594	0.00584	0.00578
	B	A	0.00000	0.00000	0.00000
	B	A	0.00096	0.00083	0.00066
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00529	0.00521	0.00514

SKY130_OSU_SC_12T_LS_x

sky130_osu_sc_12T_ls_ss_1P28_-40C.ccs
Cell Library: Process , Voltage 1.28,
Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__ant	4.39560
sky130_osu_sc_12T_ls__tiehi	4.39560
sky130_osu_sc_12T_ls__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ls__ant	0.01175
sky130_osu_sc_12T_ls__tiehi	0.00000
sky130_osu_sc_12T_ls__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__ant	0.00000	7359.82000	14719.60000
sky130_osu_sc_12T_ls__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ls__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_12T_ls__ant	0.00000	0.00000	0.00000
	-0.00125	-0.00050	0.00726

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__ant	0.00000	0.00000	0.00000
	0.12916	0.12018	0.01527