sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_LS__ADDFx
SKY130_OSU_SC_15T_LS__ADDHx
SKY130_OSU_SC_15T_LS__AND2x
SKY130_OSU_SC_15T_LS__AOI21
SKY130_OSU_SC_15T_LS__AOI22
SKY130_OSU_SC_15T_LS__BUFx
SKY130_OSU_SC_15T_LS__DFFRx
SKY130_OSU_SC_15T_LS__DFFSRx
SKY130_OSU_SC_15T_LS__DFFSx
SKY130_OSU_SC_15T_LS__DFFx
SKY130_OSU_SC_15T_LS__INVx
SKY130_OSU_SC_15T_LS__MUX2
SKY130_OSU_SC_15T_LS__NAND2x
SKY130_OSU_SC_15T_LS__NOR2x
SKY130_OSU_SC_15T_LS__OAI21
SKY130_OSU_SC_15T_LS__OAI22
SKY130_OSU_SC_15T_LS__OR2x
SKY130_OSU_SC_15T_LS__TBUFIx
SKY130_OSU_SC_15T_LS__TNBUFIx
SKY130_OSU_SC_15T_LS__XNOR2
SKY130_OSU_SC_15T_LS__XOR2
SKY130_OSU_SC_15T_LS_x

SKY130_OSU_SC_15T_LS__ADDFx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__addf_1	39.07200
sky130_osu_sc_15T_ls__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ls__addf_1	0.01426	0.01427	0.01113	1.48097	0.67589	1.42005
sky130_osu_sc_15T_ls__addf_l	0.01424	0.01427	0.01116	0.90981	0.68362	0.94181

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__addf_1	0.00000	0.00072	0.00082
sky130_osu_sc_15T_ls__addf_l	0.00000	0.00177	0.00271

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->CO (RR)	0.14021	1.62220	22.47450
	B->CO (RR)	0.12866	1.55945	21.67540
	CI->CO (RR)	0.13316	1.62651	22.65940
	CON->CO (FR)	0.03182	0.85820	12.52650
sky130_osu_sc_15T_ls__addf_1	A->CO (RR)	0.14557	1.52125	17.85590
	B->CO (RR)	0.13409	1.47317	17.40640
	CI->CO (RR)	0.13840	1.52744	18.12090
	CON->CO (FR)	0.04053	0.96004	12.50650

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->CO (FF)	0.24901	2.39334	32.50200
	B->CO (FF)	0.22251	2.28224	31.20140
	CI->CO (FF)	0.22026	2.34718	32.35280
	CON->CO (RF)	0.02031	0.53065	7.73975
sky130_osu_sc_15T_ls__addf_1	A->CO (FF)	0.23372	1.94859	22.39680
	B->CO (FF)	0.20792	1.86264	21.64020
	CI->CO (FF)	0.20436	1.90269	22.26940
	CON->CO (RF)	0.02058	0.48792	6.36506

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->CON (FR)	0.19691	1.19479	12.62050
	B->CON (FR)	0.17172	1.13022	12.21020
	CI->CON (FR)	0.16785	1.15022	12.51190
sky130_osu_sc_15T_ls__addf_l	A->CON (FR)	0.18790	1.19015	12.69580
	B->CON (FR)	0.16344	1.12577	12.28050
	CI->CON (FR)	0.15882	1.14555	12.58580

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->CON (RF)	0.07333	0.55009	6.08629
	B->CON (RF)	0.06169	0.53136	6.01029
	CI->CON (RF)	0.06618	0.55824	6.30624
sky130_osu_sc_15T_ls__addf_l	A->CON (RF)	0.07068	0.54909	6.12061
	B->CON (RF)	0.05928	0.53040	6.04367
	CI->CON (RF)	0.06349	0.55720	6.34224

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->S (-R)	0.35382	2.34613	26.98860
	B->S (-R)	0.34141	2.29178	26.31880
	CI->S (-R)	0.32300	2.29634	26.83000
	CON->S (RR)	0.08463	0.72150	7.42614
sky130_osu_sc_15T_ls__addf_l	A->S (-R)	0.34201	2.16187	22.29210
	B->S (-R)	0.32972	2.12166	21.90280
	CI->S (-R)	0.31085	2.11298	22.14990
	CON->S (RR)	0.08730	0.80070	7.38146

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addf_1	A->S (-F)	0.24235	1.40941	15.45890
	B->S (-F)	0.25986	1.38446	15.12450
	CI->S (-F)	0.23503	1.41130	15.64810
	CON->S (FF)	0.11079	0.71203	6.78106
sky130_osu_sc_15T_ls__addf_l	A->S (-F)	0.22177	1.23228	12.12380
	B->S (-F)	0.24031	1.21718	11.96520
	CI->S (-F)	0.21430	1.23559	12.37000
	CON->S (FF)	0.10003	0.68259	6.03921

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.00274	0.00262	0.00266
	B	0.00335	0.00334	0.00343
	CI	0.00345	0.00352	0.00370
sky130_osu_sc_15T_ls__addf_l	A	0.00219	0.00201	0.00202
	B	0.00280	0.00271	0.00274
	CI	0.00290	0.00290	0.00299

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.00930	0.00927	0.00965
	B	0.00911	0.00920	0.00970
	CI	0.00802	0.00825	0.00875
sky130_osu_sc_15T_ls__addf_l	A	0.00877	0.00871	0.00895
	B	0.00858	0.00864	0.00884
	CI	0.00749	0.00768	0.00792

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.00928	0.00926	0.00935
	B	0.00909	0.00917	0.00928
	CI	0.00801	0.00820	0.00835
sky130_osu_sc_15T_ls__addf_l	A	0.00877	0.00873	0.00883
	B	0.00857	0.00863	0.00875
	CI	0.00749	0.00766	0.00782

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.00271	0.00259	0.00256
	B	0.00332	0.00326	0.00310
	CI	0.00344	0.00349	0.00353
sky130_osu_sc_15T_ls__addf_l	A	0.00217	0.00200	0.00179
	B	0.00278	0.00267	0.00250
	CI	0.00289	0.00289	0.00293

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.00930	0.00927	0.00967
	B	0.00911	0.00920	0.00964
	CI	0.00802	0.00825	0.00869
sky130_osu_sc_15T_ls__addf_l	A	0.00878	0.00872	0.00897
	B	0.00859	0.00865	0.00894
	CI	0.00749	0.00769	0.00800

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addf_1	A	0.01922	0.01933	0.01935
	B	0.01724	0.01676	0.01746
	CI	0.01564	0.01555	0.01566
sky130_osu_sc_15T_ls__addf_l	A	0.01843	0.01837	0.01832
	B	0.01648	0.01593	0.01666
	CI	0.01488	0.01474	0.01483

SKY130_OSU_SC_15T_LS__ADDHx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__addh_1	23.19900
sky130_osu_sc_15T_ls__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ls__addh_1	0.00702	0.00777	1.45362	0.73736	1.47320
sky130_osu_sc_15T_ls__addh_l	0.00702	0.00778	0.96068	0.72959	0.96104

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__addh_1	0.00000	0.00065	0.00077
sky130_osu_sc_15T_ls__addh_l	0.00000	0.00194	0.00256

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->CO (RR)	0.09859	0.72044	7.17924
	B->CO (RR)	0.10183	0.72930	7.31015
sky130_osu_sc_15T_ls__addh_l	A->CO (RR)	0.10264	0.80459	7.24322
	B->CO (RR)	0.10588	0.81590	7.37525

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->CO (FF)	0.09454	0.68938	6.82550
	B->CO (FF)	0.10107	0.70131	6.88849
sky130_osu_sc_15T_ls__addh_l	A->CO (FF)	0.08725	0.63728	5.69490
	B->CO (FF)	0.09324	0.64969	5.76486

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->CON (RR)	B	0.14082	0.59148	3.68989
	A->CON (FR)	!B	0.10970	1.06867	12.48880
	B->CON (RR)	A	0.14414	0.59965	3.82459
	B->CON (FR)	!A	0.13207	1.11399	12.68140
sky130_osu_sc_15T_ls__addh_l	A->CON (RR)	B	0.13072	0.57208	3.59117
	A->CON (FR)	!B	0.10108	1.05512	12.40230
	B->CON (RR)	A	0.13405	0.58230	3.72680
	B->CON (FR)	!A	0.12345	1.10008	12.59470

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->CON (FF)	B	0.13407	0.71693	5.95046
	A->CON (RF)	!B	0.04459	0.53529	6.44619
	B->CON (FF)	A	0.13614	0.74126	6.19802
	B->CON (RF)	!A	0.05149	0.52768	6.18621
sky130_osu_sc_15T_ls__addh_l	A->CON (FF)	B	0.12572	0.70084	5.84619
	A->CON (RF)	!B	0.04206	0.53062	6.40577
	B->CON (FF)	A	0.12772	0.72553	6.09421
	B->CON (RF)	!A	0.04905	0.52336	6.14693

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->S (RR)	!B	0.10287	1.55718	22.14450
	A->S (FR)	B	0.19253	1.71559	21.18660
	B->S (RR)	!A	0.10892	1.50819	21.24850
	B->S (FR)	A	0.19622	1.78084	22.09730
	CON->S (FR)	-	0.03448	0.87500	12.70500
sky130_osu_sc_15T_ls__addh_l	A->S (RR)	!B	0.10477	1.47370	18.24510
	A->S (FR)	B	0.18862	1.62360	17.28720
	B->S (RR)	!A	0.11088	1.43565	17.63360
	B->S (FR)	A	0.19203	1.67773	17.92290
	CON->S (FR)	-	0.04069	0.96651	12.72010

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__addh_1	A->S (FF)	!B	0.15342	2.12704	30.16350
	A->S (RF)	B	0.17638	1.31143	15.17760
	B->S (FF)	!A	0.17585	2.17551	30.38950
	B->S (RF)	A	0.17966	1.31946	15.31020
	CON->S (RF)	-	0.01895	0.51857	7.56310
sky130_osu_sc_15T_ls__addh_l	A->S (FF)	!B	0.14004	1.76990	21.90810
	A->S (RF)	B	0.16366	1.10398	10.39900
	B->S (FF)	!A	0.16240	1.81779	22.11470
	B->S (RF)	A	0.16696	1.11414	10.53370
	CON->S (RF)	-	0.01933	0.48884	6.47150

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00428	0.00402	0.00380
	B	0.00000	0.00000	0.00000
	B	0.00395	0.00369	0.00331
sky130_osu_sc_15T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00375	0.00346	0.00358
	B	0.00000	0.00000	0.00000
	B	0.00342	0.00315	0.00306

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00638	0.00608	0.00588
	B	0.00000	0.00000	0.00000
	B	0.00666	0.00663	0.00645
sky130_osu_sc_15T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00586	0.00556	0.00540
	B	0.00000	0.00000	0.00000
	B	0.00615	0.00608	0.00596

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00428	0.00402	0.00402
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00565	0.00561	0.00560
	B	A	0.00000	0.00000	0.00000
	B	A	0.00394	0.00369	0.00348
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00622	0.00616	0.00609
sky130_osu_sc_15T_ls__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00375	0.00345	0.00347
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00528	0.00522	0.00524
	B	A	0.00000	0.00000	0.00000
	B	A	0.00341	0.00313	0.00311
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00585	0.00578	0.00574

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00638	0.00610	0.00589
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00095	0.00091	0.00052
	B	A	0.00000	0.00000	0.00000
	B	A	0.00667	0.00664	0.00675
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00155	0.00147	0.00138
sky130_osu_sc_15T_ls__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00587	0.00557	0.00548
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00048	0.00044	0.00019
	B	A	0.00000	0.00000	0.00000
	B	A	0.00616	0.00609	0.00608
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00108	0.00099	0.00089

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00639	0.00609	0.00603
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00095	0.00095	0.00082
	B	A	0.00000	0.00000	0.00000
	B	A	0.00667	0.00664	0.00665
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00156	0.00150	0.00134
sky130_osu_sc_15T_ls__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00587	0.00557	0.00537
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00048	0.00045	0.00025
	B	A	0.00000	0.00000	0.00000
	B	A	0.00616	0.00609	0.00605
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00109	0.00100	0.00052

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00428	0.00402	0.00379
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00565	0.00564	0.00559
	B	A	0.00000	0.00000	0.00000
	B	A	0.00395	0.00369	0.00325
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00622	0.00621	0.00609
sky130_osu_sc_15T_ls__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00375	0.00346	0.00355
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00528	0.00523	0.00525
	B	A	0.00000	0.00000	0.00000
	B	A	0.00341	0.00313	0.00315
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00585	0.00580	0.00574

SKY130_OSU_SC_15T_LS__AND2x

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__and2_1	10.37850
sky130_osu_sc_15T_ls__and2_2	12.82050
sky130_osu_sc_15T_ls__and2_4	17.70450
sky130_osu_sc_15T_ls__and2_6	22.58850
sky130_osu_sc_15T_ls__and2_8	27.47250
sky130_osu_sc_15T_ls__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__and2_1	0.00379	0.00388	1.45822
sky130_osu_sc_15T_ls__and2_2	0.00379	0.00388	2.88460
sky130_osu_sc_15T_ls__and2_4	0.00379	0.00388	5.47755
sky130_osu_sc_15T_ls__and2_6	0.00382	0.00388	8.11026
sky130_osu_sc_15T_ls__and2_8	0.00379	0.00389	10.44717
sky130_osu_sc_15T_ls__and2_l	0.00296	0.00307	0.91986

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__and2_1	0.00000	0.00030	0.00044
sky130_osu_sc_15T_ls__and2_2	0.00000	0.00046	0.00050
sky130_osu_sc_15T_ls__and2_4	0.00000	0.00078	0.00086
sky130_osu_sc_15T_ls__and2_6	0.00000	0.00109	0.00125
sky130_osu_sc_15T_ls__and2_8	0.00000	0.00141	0.00163
sky130_osu_sc_15T_ls__and2_l	0.00000	0.00159	0.00250

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__and2_1	A->Y (RR)	0.07549	0.65699	6.81229
	B->Y (RR)	0.07993	0.67314	6.96028
sky130_osu_sc_15T_ls__and2_2	A->Y (RR)	0.08584	0.59271	7.05509
	B->Y (RR)	0.09025	0.60311	7.18392
sky130_osu_sc_15T_ls__and2_4	A->Y (RR)	0.11832	0.59221	7.39581
	B->Y (RR)	0.12273	0.59669	7.50284
sky130_osu_sc_15T_ls__and2_6	A->Y (RR)	0.15000	0.62057	7.73661
	B->Y (RR)	0.15419	0.62110	7.83303
sky130_osu_sc_15T_ls__and2_8	A->Y (RR)	0.18131	0.65470	7.93138
	B->Y (RR)	0.18569	0.65290	8.02354
sky130_osu_sc_15T_ls__and2_l	A->Y (RR)	0.08132	0.72349	6.43402
	B->Y (RR)	0.08579	0.73956	6.55426

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__and2_1	A->Y (FF)	0.07190	0.62576	6.35257
	B->Y (FF)	0.07725	0.64111	6.45188
sky130_osu_sc_15T_ls__and2_2	A->Y (FF)	0.08548	0.61403	6.61204
	B->Y (FF)	0.09088	0.62609	6.69218
sky130_osu_sc_15T_ls__and2_4	A->Y (FF)	0.12148	0.64268	6.94039
	B->Y (FF)	0.12635	0.65195	7.00234
sky130_osu_sc_15T_ls__and2_6	A->Y (FF)	0.15932	0.68311	7.24285
	B->Y (FF)	0.16351	0.68979	7.29480
sky130_osu_sc_15T_ls__and2_8	A->Y (FF)	0.19470	0.71803	7.36431
	B->Y (FF)	0.19859	0.72391	7.42660
sky130_osu_sc_15T_ls__and2_l	A->Y (FF)	0.07994	0.63433	5.76188
	B->Y (FF)	0.08783	0.65215	5.86488

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00321	0.00277	0.00358
	B	0.00000	0.00000	0.00000
	B	0.00326	0.00290	0.00309
sky130_osu_sc_15T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.00609	0.00589	0.00672
	B	0.00000	0.00000	0.00000
	B	0.00616	0.00596	0.00639
sky130_osu_sc_15T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.01244	0.01273	0.01364
	B	0.00000	0.00000	0.00000
	B	0.01250	0.01282	0.01322
sky130_osu_sc_15T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.01874	0.01944	0.02145
	B	0.00000	0.00000	0.00000
	B	0.01877	0.01957	0.02117
sky130_osu_sc_15T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.02500	0.02607	0.02824
	B	0.00000	0.00000	0.00000
	B	0.02507	0.02625	0.02781
sky130_osu_sc_15T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00232	0.00201	0.00345
	B	0.00000	0.00000	0.00000
	B	0.00238	0.00199	0.00276

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00786	0.00768	0.00870
	B	0.00000	0.00000	0.00000
	B	0.00889	0.00866	0.00953
sky130_osu_sc_15T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.01003	0.01028	0.01123
	B	0.00000	0.00000	0.00000
	B	0.01109	0.01122	0.01201
sky130_osu_sc_15T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.01525	0.01632	0.01739
	B	0.00000	0.00000	0.00000
	B	0.01632	0.01720	0.01807
sky130_osu_sc_15T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.02062	0.02246	0.02382
	B	0.00000	0.00000	0.00000
	B	0.02168	0.02320	0.02433
sky130_osu_sc_15T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.02571	0.02828	0.03004
	B	0.00000	0.00000	0.00000
	B	0.02675	0.02895	0.03036
sky130_osu_sc_15T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00610	0.00595	0.00728
	B	0.00000	0.00000	0.00000
	B	0.00688	0.00666	0.00783

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00276	-0.00276	-0.00278
sky130_osu_sc_15T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00276	-0.00276	-0.00278
sky130_osu_sc_15T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00276	-0.00277	-0.00278
sky130_osu_sc_15T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00278	-0.00279	-0.00280
sky130_osu_sc_15T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00276	-0.00277	-0.00278
sky130_osu_sc_15T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00202	-0.00203	-0.00203

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00284	0.00279
sky130_osu_sc_15T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00285	0.00279
sky130_osu_sc_15T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00285	0.00279
sky130_osu_sc_15T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00279	0.00286	0.00281
sky130_osu_sc_15T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00277	0.00284	0.00279
sky130_osu_sc_15T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00203	0.00208	0.00204

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00258	-0.00259	-0.00259
sky130_osu_sc_15T_ls__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00259	-0.00259	-0.00259
sky130_osu_sc_15T_ls__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00259	-0.00260	-0.00259
sky130_osu_sc_15T_ls__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00259	-0.00260	-0.00259
sky130_osu_sc_15T_ls__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00259	-0.00260	-0.00259
sky130_osu_sc_15T_ls__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00190	-0.00192	-0.00191

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00259	0.00259	0.00260
sky130_osu_sc_15T_ls__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00259	0.00260
sky130_osu_sc_15T_ls__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00260	0.00260
sky130_osu_sc_15T_ls__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00260	0.00260
sky130_osu_sc_15T_ls__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00260	0.00260	0.00260
sky130_osu_sc_15T_ls__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00192	0.00192	0.00191

SKY130_OSU_SC_15T_LS__AOI21

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ls__aoi21_l	0.00353	0.00371	0.00363	0.65639

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__aoi21_l	0.00000	0.00017	0.00019

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__aoi21_l	A0->Y (FR)	0.10413	1.11269	12.55120
	A1->Y (FR)	0.08642	1.05151	12.11320
	B0->Y (FR)	0.07865	1.07163	12.44610

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__aoi21_l	A0->Y (RF)	0.03863	0.49612	5.78591
	A1->Y (RF)	0.03441	0.48992	5.78974
	B0->Y (RF)	0.02375	0.43902	5.25777

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00660	0.00652	0.00652
	A1	0.00000	0.00000	0.00000
	A1	0.00550	0.00539	0.00541
	B0	0.00530	0.00514	0.00527

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00119	0.00099	0.00092
	A1	0.00000	0.00000	0.00000
	A1	0.00122	0.00099	0.00094
	B0	-0.00055	-0.00061	-0.00059

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00224	-0.00233	-0.00232
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00237	-0.00239	-0.00238
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00237	-0.00239	-0.00238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00232	0.00233	0.00232
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00237	0.00243	0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00239	0.00242	0.00239

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00220	-0.00230	-0.00228
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00232	-0.00235	-0.00233
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00257	-0.00259	-0.00259

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00227	0.00230	0.00228
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00233	0.00235	0.00234
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00259	0.00260	0.00260

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00116	-0.00119	-0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00129	0.00130	0.00120

SKY130_OSU_SC_15T_LS__AOI22

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ls__aoi22_l	0.00352	0.00368	0.00385	0.00364	0.66798

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__aoi22_l	0.00000	0.00021	0.00039

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__aoi22_l	A0->Y (FR)	0.12860	1.13235	12.53900
	A1->Y (FR)	0.11397	1.10550	12.41800
	B0->Y (FR)	0.08092	1.05116	12.27640
	B1->Y (FR)	0.09568	1.07785	12.43990

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__aoi22_l	A0->Y (RF)	0.04910	0.51112	5.85402
	A1->Y (RF)	0.04485	0.50540	5.86123
	B0->Y (RF)	0.02808	0.48298	5.83969
	B1->Y (RF)	0.03225	0.48916	5.83346

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	A0	0.00818	0.00808	0.00807
	A1	0.00711	0.00695	0.00695
	B0	0.00570	0.00548	0.00556
	B1	0.00673	0.00655	0.00663

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	A0	0.00251	0.00232	0.00221
	A1	0.00254	0.00231	0.00223
	B0	-0.00027	-0.00036	-0.00038
	B1	-0.00021	-0.00024	-0.00029

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00224	-0.00232	-0.00232
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00237	-0.00239	-0.00238
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00237	-0.00239	-0.00238
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00237	-0.00239	-0.00238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00231	0.00232	0.00232
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00237	0.00240	0.00239
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00238	0.00242	0.00239
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00238	0.00242	0.00239

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00221	-0.00229	-0.00228
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00232	-0.00235	-0.00233
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00256	-0.00258	-0.00258
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00256	-0.00258	-0.00258

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00226	0.00229	0.00228
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00233	0.00235	0.00234
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00258	0.00258	0.00259
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00258	0.00258	0.00259

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00117	-0.00120	-0.00117
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00117	-0.00118	-0.00117
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00267	-0.00267	-0.00269
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00267	-0.00267	-0.00269

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00134	0.00136	0.00122
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00117	0.00118	0.00117
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00268	0.00270	0.00270
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00269	0.00270	0.00270

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00118	-0.00121	-0.00118
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00118	-0.00119	-0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00243	-0.00243	-0.00243
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00243	-0.00244	-0.00243

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00135	0.00137	0.00123
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00118	0.00119	0.00118
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00244	0.00245	0.00244
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00244	0.00245	0.00244

SKY130_OSU_SC_15T_LS__BUFx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__buf_1	7.93650
sky130_osu_sc_15T_ls__buf_2	10.37850
sky130_osu_sc_15T_ls__buf_4	15.26250
sky130_osu_sc_15T_ls__buf_6	20.14650
sky130_osu_sc_15T_ls__buf_8	25.03050
sky130_osu_sc_15T_ls__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ls__buf_1	0.00388	1.43395
sky130_osu_sc_15T_ls__buf_2	0.00392	2.87314
sky130_osu_sc_15T_ls__buf_4	0.00392	5.48918
sky130_osu_sc_15T_ls__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ls__buf_8	0.00393	10.74704
sky130_osu_sc_15T_ls__buf_l	0.00310	0.92191

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__buf_1	0.00000	0.00025	0.00025
sky130_osu_sc_15T_ls__buf_2	0.00000	0.00037	0.00044
sky130_osu_sc_15T_ls__buf_4	0.00000	0.00062	0.00083
sky130_osu_sc_15T_ls__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ls__buf_8	0.00000	0.00112	0.00160
sky130_osu_sc_15T_ls__buf_l	0.00000	0.00129	0.00129

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__buf_1	**A->Y (RR)**	0.05975	0.63241	6.76745
sky130_osu_sc_15T_ls__buf_2	**A->Y (RR)**	0.06741	0.56173	7.01399
sky130_osu_sc_15T_ls__buf_4	**A->Y (RR)**	0.09155	0.54995	7.31288
sky130_osu_sc_15T_ls__buf_8	**A->Y (RR)**	0.13855	0.59687	7.92504
sky130_osu_sc_15T_ls__buf_l	**A->Y (RR)**	0.06692	0.69770	6.37215

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__buf_1	**A->Y (FF)**	0.06802	0.61356	6.23806
sky130_osu_sc_15T_ls__buf_2	**A->Y (FF)**	0.08306	0.61919	6.77469
sky130_osu_sc_15T_ls__buf_4	**A->Y (FF)**	0.11944	0.64933	7.20574
sky130_osu_sc_15T_ls__buf_8	**A->Y (FF)**	0.19305	0.72831	7.77767
sky130_osu_sc_15T_ls__buf_l	**A->Y (FF)**	0.07669	0.62418	5.72165

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00297	0.00247	0.00454
sky130_osu_sc_15T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00586	0.00543	0.00610
sky130_osu_sc_15T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.01225	0.01229	0.01311
sky130_osu_sc_15T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.02476	0.02577	0.02755
sky130_osu_sc_15T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00223	0.00184	0.00311

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00762	0.00738	0.00836
sky130_osu_sc_15T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00986	0.00993	0.01077
sky130_osu_sc_15T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.01513	0.01593	0.01685
sky130_osu_sc_15T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.02567	0.02786	0.02928
sky130_osu_sc_15T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00596	0.00573	0.00701

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ls__buf_6	0.00000	0.00000	0.00000
	-0.00052	-0.00052	-0.00052

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ls__buf_6	0.00000	0.00000	0.00000
	0.00052	0.00052	0.00052

SKY130_OSU_SC_15T_LS__DFFRx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__dffr_1	53.11350
sky130_osu_sc_15T_ls__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ls__dffr_1	0.00363	0.00365	0.01103	1.35661	1.33996
sky130_osu_sc_15T_ls__dffr_l	0.00363	0.00365	0.01102	0.90973	0.91182

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__dffr_1	0.00000	0.00224	0.00316
sky130_osu_sc_15T_ls__dffr_l	0.00000	0.00328	0.00421

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffr_1	CK->Q (RR)	0.35703	1.42146	13.70660
	QN->Q (FR)	0.04010	0.98862	14.19050
sky130_osu_sc_15T_ls__dffr_l	CK->Q (RR)	0.33701	1.45164	12.41080
	QN->Q (FR)	0.04479	1.03689	13.57630

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffr_1	CK->Q (RF)	0.31754	1.44277	14.80490
	QN->Q (RF)	0.02311	0.59213	8.47902
	RN->Q (FF)	0.22831	1.55624	17.58740
sky130_osu_sc_15T_ls__dffr_l	CK->Q (RF)	0.32197	1.51596	13.56090
	QN->Q (RF)	0.02229	0.54631	7.22834
	RN->Q (FF)	0.23289	1.62880	16.33770

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffr_1	CK->QN (RR)	0.28353	0.89015	7.10121
	RN->QN (FR)	0.19416	1.00320	9.88000
sky130_osu_sc_15T_ls__dffr_l	CK->QN (RR)	0.28757	0.97554	7.16825
	RN->QN (FR)	0.19826	1.08839	9.94432

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffr_1	**CK->QN (RF)**	0.29745	0.68951	3.61370
sky130_osu_sc_15T_ls__dffr_l	**CK->QN (RF)**	0.27281	0.65612	3.03039

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	hold	CK (R)	-0.05629	-0.09041	-0.52065
	setup	CK (R)	0.27975	0.31340	2.07444
sky130_osu_sc_15T_ls__dffr_l	hold	CK (R)	-0.05580	-0.08788	-0.51996
	setup	CK (R)	0.28197	0.31759	2.09296

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	hold	CK (R)	-0.13604	-0.45961	-5.65748
	setup	CK (R)	0.16279	0.47604	5.83781
sky130_osu_sc_15T_ls__dffr_l	hold	CK (R)	-0.13761	-0.46090	-5.62478
	setup	CK (R)	0.16352	0.47604	5.83798

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	hold	CK (R)	-0.05629	-0.09041	-0.52065
	setup	CK (R)	0.27975	0.31340	2.07444
sky130_osu_sc_15T_ls__dffr_l	hold	CK (R)	-0.05580	-0.08788	-0.51996
	setup	CK (R)	0.28197	0.31759	2.09296

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	hold	CK (R)	-0.13604	-0.45961	-5.65748
	setup	CK (R)	0.16279	0.47604	5.83781
sky130_osu_sc_15T_ls__dffr_l	hold	CK (R)	-0.13761	-0.46090	-5.62478
	setup	CK (R)	0.16352	0.47604	5.83798

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	recovery	CK (R)	0.25130	0.27577	1.91469
	removal	CK (R)	-0.04510	-0.05608	-0.12925
sky130_osu_sc_15T_ls__dffr_l	recovery	CK (R)	0.25092	0.28353	1.97721
	removal	CK (R)	-0.04517	-0.05608	-0.12925

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	recovery	CK (R)	0.25130	0.27577	1.91469
	removal	CK (R)	-0.04510	-0.05608	-0.12925
sky130_osu_sc_15T_ls__dffr_l	recovery	CK (R)	0.25092	0.28353	1.97721
	removal	CK (R)	-0.04517	-0.05608	-0.12925

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	min_pulse_width	RN ()	0.13544	0.46265	13.33370
	min_pulse_width	RN ()	0.13544	0.46265	13.33370
sky130_osu_sc_15T_ls__dffr_l	min_pulse_width	RN ()	0.13544	0.46265	13.33370
	min_pulse_width	RN ()	0.13196	0.46265	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	min_pulse_width	CK ()	0.15981	0.46265	13.33370
	min_pulse_width	CK ()	0.15981	0.46265	13.33370
sky130_osu_sc_15T_ls__dffr_l	min_pulse_width	CK ()	0.14588	0.46265	13.33370
	min_pulse_width	CK ()	0.15633	0.46265	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffr_1	min_pulse_width	CK ()	0.35731	0.48037	13.33370
	min_pulse_width	CK ()	0.12848	0.46265	13.33370
sky130_osu_sc_15T_ls__dffr_l	min_pulse_width	CK ()	0.35731	0.48037	13.33370
	min_pulse_width	CK ()	0.12848	0.46265	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00765	0.00552	0.00000
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00677	0.00509	0.00000

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00875	0.00729	0.00000
	RN	-0.00104	-0.05707	-0.82536
	RN	0.01986	0.01845	0.00348
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00786	0.00686	0.00000
	RN	-0.00104	-0.04490	-0.55348
	RN	0.01895	0.01799	0.01096

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00875	0.00731	0.00000
	RN	-0.00104	-0.05664	-0.81523
	RN	0.01986	0.01846	0.00379
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00786	0.00687	0.00000
	RN	-0.00104	-0.04496	-0.55475
	RN	0.01896	0.01799	0.01083

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00762	0.00551	0.00000
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00674	0.00507	0.00000

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00216	-0.00232	-0.00231
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00930	0.00882	0.00884
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00391	0.00350	0.00360
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00216	-0.00232	-0.00231
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00930	0.00881	0.00884
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00391	0.00350	0.00360

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00229	0.00232	0.00231
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01458	0.01435	0.01427
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00700	0.00680	0.00683
sky130_osu_sc_15T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00229	0.00232	0.00231
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01458	0.01435	0.01427
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00700	0.00680	0.00683

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00294	0.00243	0.00302
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00861	0.00786	0.00829
sky130_osu_sc_15T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00294	0.00243	0.00302
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00860	0.00786	0.00829

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00732	0.00699	0.00790
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01492	0.01435	0.01503
sky130_osu_sc_15T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00732	0.00699	0.00790
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01492	0.01435	0.01503

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00041	-0.00104	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00470	0.00343	0.00366
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00070	-0.00133	-0.00078
sky130_osu_sc_15T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00041	-0.00104	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00470	0.00343	0.00366
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00070	-0.00133	-0.00078

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01125	0.01088	0.01168
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02354	0.02268	0.02274
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01771	0.01711	0.01751
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02293	0.02210	0.02381
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01230	0.01188	0.01273
sky130_osu_sc_15T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01125	0.01087	0.01168
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02354	0.02268	0.02274
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01771	0.01711	0.01751
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02293	0.02210	0.02382
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01230	0.01188	0.01273

SKY130_OSU_SC_15T_LS__DFFSRx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__dffsr_1	57.99750
sky130_osu_sc_15T_ls__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_15T_ls__dffsr_1	0.00359	0.00365	0.00806	0.01128	1.48467	1.47333
sky130_osu_sc_15T_ls__dffsr_l	0.00359	0.00365	0.00804	0.01128	0.91900	0.91595

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ls__dffsr_1	0.00000	0.00121	0.00152
sky130_osu_sc_15T_ls__dffsr_l	0.00000	0.00226	0.00257

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffsr_1	CK->Q (RR)	0.34863	1.42910	14.41670
	QN->Q (FR)	0.03500	0.92145	13.48240
	RN->Q (RR)	0.28211	1.37576	14.50750
	SN->Q (FR)	0.26529	1.56318	17.89890
sky130_osu_sc_15T_ls__dffsr_l	CK->Q (RR)	0.34094	1.46765	12.60310
	QN->Q (FR)	0.04485	1.03885	13.63600
	RN->Q (RR)	0.27313	1.41340	12.67590
	SN->Q (FR)	0.26004	1.60167	16.02830

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffsr_1	CK->Q (RF)	0.36430	1.48898	15.31400
	QN->Q (RF)	0.02288	0.60932	8.89074
	RN->Q (FF)	0.23810	1.56845	18.13240
sky130_osu_sc_15T_ls__dffsr_l	CK->Q (RF)	0.37458	1.57855	13.76390
	QN->Q (RF)	0.02225	0.54738	7.25780
	RN->Q (FF)	0.24869	1.65741	16.56650

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffsr_1	CK->QN (RR)	0.33062	0.92608	7.18595
	RN->QN (FR)	0.20499	1.00476	9.99313
sky130_osu_sc_15T_ls__dffsr_l	CK->QN (RR)	0.33969	1.03325	7.26789
	RN->QN (FR)	0.21406	1.11195	10.06540

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffsr_1	CK->QN (RF)	0.29553	0.70647	4.04056
	RN->QN (RF)	0.22955	0.65338	4.13216
	SN->QN (FF)	0.21453	0.84083	7.51103
sky130_osu_sc_15T_ls__dffsr_l	CK->QN (RF)	0.28008	0.66898	3.12472
	RN->QN (RF)	0.21500	0.61688	3.20961
	SN->QN (FF)	0.19996	0.80295	6.55152

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	hold	CK (R)	-0.06013	-0.09400	-0.60160
	setup	CK (R)	0.26574	0.29529	1.98643
sky130_osu_sc_15T_ls__dffsr_l	hold	CK (R)	-0.06044	-0.09772	-0.60185
	setup	CK (R)	0.26598	0.29696	2.00217

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	hold	CK (R)	-0.16373	-0.48532	-5.92593
	setup	CK (R)	0.19714	0.49681	6.07383
sky130_osu_sc_15T_ls__dffsr_l	hold	CK (R)	-0.16290	-0.48451	-5.91774
	setup	CK (R)	0.19666	0.49681	6.07351

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	hold	CK (R)	-0.06013	-0.09400	-0.60160
	setup	CK (R)	0.26574	0.29529	1.98643
sky130_osu_sc_15T_ls__dffsr_l	hold	CK (R)	-0.06044	-0.09772	-0.60185
	setup	CK (R)	0.26598	0.29696	2.00217

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	hold	CK (R)	-0.16373	-0.48532	-5.92593
	setup	CK (R)	0.19714	0.49681	6.07383
sky130_osu_sc_15T_ls__dffsr_l	hold	CK (R)	-0.16290	-0.48451	-5.91774
	setup	CK (R)	0.19666	0.49681	6.07351

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	recovery	CK (R)	0.21374	0.23732	1.64983
	removal	CK (R)	-0.02528	-0.03044	-0.09515
	hold	SN (R)	-0.21310	-0.42334	-3.08019
	setup	SN (R)	0.23360	0.46481	6.54042
sky130_osu_sc_15T_ls__dffsr_l	recovery	CK (R)	0.21514	0.23694	1.66501
	removal	CK (R)	-0.02528	-0.03044	-0.09515
	hold	SN (R)	-0.19989	-0.41052	-2.96564
	setup	SN (R)	0.23207	0.44998	6.43918

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	recovery	CK (R)	0.21374	0.23732	1.64983
	removal	CK (R)	-0.02528	-0.03044	-0.09515
	hold	SN (R)	-0.21568	-0.42334	-3.08019
	hold	SN (R)	-0.21310	-0.42547	-3.08582
	setup	SN (R)	0.23217	0.46381	6.32824
	setup	SN (R)	0.23360	0.46481	6.54042
sky130_osu_sc_15T_ls__dffsr_l	recovery	CK (R)	0.21514	0.23694	1.66501
	removal	CK (R)	-0.02528	-0.03044	-0.09515
	hold	SN (R)	-0.20268	-0.41052	-2.96564
	hold	SN (R)	-0.19989	-0.41052	-2.97446
	setup	SN (R)	0.23207	0.44684	6.30433
	setup	SN (R)	0.22057	0.44998	6.43918

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	min_pulse_width	RN ()	0.15633	0.46265	13.33370
	min_pulse_width	RN ()	0.15981	0.46265	13.33370
sky130_osu_sc_15T_ls__dffsr_l	min_pulse_width	RN ()	0.15633	0.46265	13.33370
	min_pulse_width	RN ()	0.15633	0.46265	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	recovery	CK (R)	0.03658	0.07362	4.93812
	removal	CK (R)	-0.01236	-0.05022	-0.43439
sky130_osu_sc_15T_ls__dffsr_l	recovery	CK (R)	0.03695	0.07253	4.75435
	removal	CK (R)	-0.01236	-0.05022	-0.43439

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	recovery	CK (R)	0.03658	0.07362	4.93812
	removal	CK (R)	-0.01236	-0.05022	-0.43439
sky130_osu_sc_15T_ls__dffsr_l	recovery	CK (R)	0.03695	0.07253	4.75435
	removal	CK (R)	-0.01236	-0.05022	-0.43439

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	min_pulse_width	SN ()	0.21537	0.52468	13.33370
	min_pulse_width	SN ()	0.21623	0.52690	13.33370
sky130_osu_sc_15T_ls__dffsr_l	min_pulse_width	SN ()	0.21610	0.50696	13.33370
	min_pulse_width	SN ()	0.20931	0.50917	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	min_pulse_width	CK ()	0.15285	0.46265	13.33370
	min_pulse_width	CK ()	0.18765	0.46265	13.33370
sky130_osu_sc_15T_ls__dffsr_l	min_pulse_width	CK ()	0.14588	0.46265	13.33370
	min_pulse_width	CK ()	0.18765	0.46265	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	min_pulse_width	CK ()	0.34052	0.46708	13.33370
	min_pulse_width	CK ()	0.16677	0.46265	13.33370
sky130_osu_sc_15T_ls__dffsr_l	min_pulse_width	CK ()	0.34403	0.46708	13.33370
	min_pulse_width	CK ()	0.16329	0.46265	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00943	0.00715	0.00000
	RN	0.01740	0.01533	-0.00983
	SN	-0.00104	-0.06024	-0.90327
	SN	0.01909	0.01709	-0.00986
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00866	0.00699	-0.00125
	RN	0.01661	0.01515	0.00170
	SN	-0.00104	-0.04517	-0.55912
	SN	0.01831	0.01692	0.00324

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00903	0.00000
	RN	-0.00104	-0.06024	-0.90327
	RN	0.02070	0.01971	0.01016
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00916	0.00823	0.00125
	RN	-0.00104	-0.04517	-0.55912
	RN	0.01986	0.01890	0.01179

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00998	0.00904	0.00000
	RN	-0.00104	-0.05996	-0.89638
	RN	0.02070	0.01970	0.01013
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00917	0.00826	0.00139
	RN	-0.00104	-0.04508	-0.55727
	RN	0.01986	0.01889	0.01183

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00940	0.00714	0.00000
	RN	0.01737	0.01531	-0.00993
	SN	-0.00104	-0.05996	-0.89633
	SN	0.01906	0.01707	-0.00894
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00862	0.00695	-0.00139
	RN	0.01658	0.01512	0.00165
	SN	-0.00104	-0.04508	-0.55724
	SN	0.01828	0.01689	0.00311

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00222	-0.00232	-0.00231
	(!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)	0.01184	0.01138	0.01141
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00436	0.00396	0.00404
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00434	0.00394	0.00404
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00440	0.00400	0.00408
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00222	-0.00232	-0.00231
	(!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)	0.01184	0.01138	0.01141
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00436	0.00396	0.00404
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00434	0.00394	0.00404
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00440	0.00400	0.00408

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00230	0.00232	0.00231
	(!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)	0.01664	0.01638	0.01610
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00754	0.00736	0.00737
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00756	0.00738	0.00738
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00749	0.00732	0.00732
sky130_osu_sc_15T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00230	0.00232	0.00231
	(!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)	0.01663	0.01637	0.01610
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00753	0.00735	0.00737
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00755	0.00734	0.00737
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00749	0.00731	0.00733

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00258	0.00206	0.00256
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01036	0.00953	0.00995
sky130_osu_sc_15T_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)	0.00258	0.00206	0.00257
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01036	0.00953	0.00995

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00803	0.00770	0.00863
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01592	0.01525	0.01589
sky130_osu_sc_15T_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)	0.00802	0.00769	0.00862
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01591	0.01524	0.01588

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	-0.00546	-0.00550	-0.00551
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00572	-0.00583	-0.00581
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00546	-0.00551	-0.00550
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00322	0.00275	0.00291
sky130_osu_sc_15T_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)	-0.00546	-0.00550	-0.00551
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00571	-0.00581	-0.00580
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00545	-0.00552	-0.00550
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00323	0.00275	0.00292

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00550	0.00564	0.00552
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00577	0.00584	0.00581
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00547	0.00556	0.00551
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01220	0.01188	0.01193
sky130_osu_sc_15T_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)	0.00550	0.00564	0.00552
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00576	0.00583	0.00580
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00547	0.00556	0.00550
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01219	0.01187	0.01192

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00042	-0.00104	-0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00540	0.00420	0.00441
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00534	0.00414	0.00438
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00054	-0.00118	-0.00063
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00334	0.00217	0.00336
sky130_osu_sc_15T_ls__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00042	-0.00104	-0.00051
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00539	0.00419	0.00440
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00533	0.00413	0.00437
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00054	-0.00118	-0.00063
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00334	0.00217	0.00336

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ls__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02621	0.02541	0.02548
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01129	0.01091	0.01173
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01797	0.01744	0.01778
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01802	0.01747	0.01787
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02493	0.02403	0.02555
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01218	0.01181	0.01261
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01497	0.01423	0.01599
sky130_osu_sc_15T_ls__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02621	0.02541	0.02548
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01129	0.01091	0.01173
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01797	0.01744	0.01778
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01802	0.01747	0.01787
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02493	0.02403	0.02554
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01219	0.01181	0.01261
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01496	0.01422	0.01599

SKY130_OSU_SC_15T_LS__DFFSx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__dffs_1	48.22950
sky130_osu_sc_15T_ls__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ls__dffs_1	0.00362	0.00664	0.01100	1.36079	1.34660
sky130_osu_sc_15T_ls__dffs_l	0.00362	0.00664	0.01099	0.92151	0.92572

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__dffs_1	0.00000	0.00251	0.00553
sky130_osu_sc_15T_ls__dffs_l	0.00000	0.00356	0.00657

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffs_1	CK->Q (RR)	0.26033	1.31076	13.60290
	QN->Q (FR)	0.04012	0.98440	14.14660
	SN->Q (FR)	0.21820	1.50585	16.91860
sky130_osu_sc_15T_ls__dffs_l	CK->Q (RR)	0.25155	1.36077	12.45130
	QN->Q (FR)	0.04475	1.03793	13.63340
	SN->Q (FR)	0.20823	1.55172	15.70090

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffs_1	CK->Q (RF)	0.34053	1.46617	14.82290
	QN->Q (RF)	0.02298	0.58979	8.45963
sky130_osu_sc_15T_ls__dffs_l	CK->Q (RF)	0.34318	1.54398	13.72480
	QN->Q (RF)	0.02220	0.54585	7.25128

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffs_1	CK->QN (RR)	0.30571	0.91469	7.13113
sky130_osu_sc_15T_ls__dffs_l	CK->QN (RR)	0.30834	1.00196	7.27646

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dffs_1	CK->QN (RF)	0.20810	0.58202	3.51894
	SN->QN (FF)	0.16480	0.77913	6.83476
sky130_osu_sc_15T_ls__dffs_l	CK->QN (RF)	0.19435	0.56224	2.97628
	SN->QN (FF)	0.15035	0.75436	6.23086

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	hold	CK (R)	-0.04114	-0.07568	-0.49540
	setup	CK (R)	0.19252	0.23096	2.29511
sky130_osu_sc_15T_ls__dffs_l	hold	CK (R)	-0.04144	-0.07944	-0.49513
	setup	CK (R)	0.19329	0.23329	2.42469

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	hold	CK (R)	-0.14130	-0.46309	-4.42187
	setup	CK (R)	0.17779	0.47965	5.88455
sky130_osu_sc_15T_ls__dffs_l	hold	CK (R)	-0.14198	-0.46144	-3.93216
	setup	CK (R)	0.17774	0.47961	5.88481

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	hold	CK (R)	-0.04114	-0.07568	-0.49540
	setup	CK (R)	0.19252	0.23096	2.29511
sky130_osu_sc_15T_ls__dffs_l	hold	CK (R)	-0.04144	-0.07944	-0.49513
	setup	CK (R)	0.19329	0.23329	2.42469

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	hold	CK (R)	-0.14130	-0.46309	-4.42187
	setup	CK (R)	0.17779	0.47965	5.88455
sky130_osu_sc_15T_ls__dffs_l	hold	CK (R)	-0.14198	-0.46144	-3.93216
	setup	CK (R)	0.17774	0.47961	5.88481

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	recovery	CK (R)	0.03356	0.04703	3.83123
	removal	CK (R)	-0.00982	-0.01931	0.11709
sky130_osu_sc_15T_ls__dffs_l	recovery	CK (R)	0.03344	0.04703	3.58396
	removal	CK (R)	-0.00982	-0.01931	0.11709

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	recovery	CK (R)	0.03356	0.04703	3.83123
	removal	CK (R)	-0.00982	-0.01931	0.11709
sky130_osu_sc_15T_ls__dffs_l	recovery	CK (R)	0.03344	0.04703	3.58396
	removal	CK (R)	-0.00982	-0.01931	0.11709

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	min_pulse_width	SN ()	0.15860	0.52025	13.33370
	min_pulse_width	SN ()	0.16581	0.51803	13.33370
sky130_osu_sc_15T_ls__dffs_l	min_pulse_width	SN ()	0.15613	0.49810	13.33370
	min_pulse_width	SN ()	0.15677	0.50031	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	min_pulse_width	CK ()	0.10063	0.46265	13.33370
	min_pulse_width	CK ()	0.16677	0.46265	13.33370
sky130_osu_sc_15T_ls__dffs_l	min_pulse_width	CK ()	0.09715	0.46265	13.33370
	min_pulse_width	CK ()	0.16329	0.46265	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dffs_1	min_pulse_width	CK ()	0.26771	0.46265	13.33370
	min_pulse_width	CK ()	0.14588	0.46265	13.33370
sky130_osu_sc_15T_ls__dffs_l	min_pulse_width	CK ()	0.26771	0.46265	13.33370
	min_pulse_width	CK ()	0.14588	0.46265	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00765	0.00542	0.00000
	SN	-0.00104	-0.05717	-0.82791
	SN	0.01651	0.01448	-0.00854
sky130_osu_sc_15T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00676	0.00498	-0.00000
	SN	-0.00104	-0.04525	-0.56065
	SN	0.01562	0.01406	0.00148

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00873	0.00733	0.00000
sky130_osu_sc_15T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00784	0.00688	0.00000

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00874	0.00734	0.00000
sky130_osu_sc_15T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00784	0.00688	0.00003

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00762	0.00542	0.00000
	SN	-0.00104	-0.05681	-0.81922
	SN	0.01648	0.01447	-0.00729
sky130_osu_sc_15T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00673	0.00496	-0.00003
	SN	-0.00104	-0.04537	-0.56318
	SN	0.01559	0.01403	0.00139

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00236	-0.00235
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00912	0.00858	0.00856
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00383	0.00342	0.00351
sky130_osu_sc_15T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00236	-0.00235
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00912	0.00858	0.00856
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00383	0.00342	0.00351

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00234	0.00236	0.00235
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01451	0.01422	0.01407
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00718	0.00698	0.00702
sky130_osu_sc_15T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00235	0.00236	0.00235
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01451	0.01422	0.01407
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00718	0.00698	0.00702

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00408	-0.00411	-0.00410
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00293	0.00252	0.00355
sky130_osu_sc_15T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00408	-0.00411	-0.00410
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00293	0.00252	0.00355

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00410	0.00415	0.00411
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00868	0.00826	0.00930
sky130_osu_sc_15T_ls__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00410	0.00415	0.00411
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00868	0.00826	0.00930

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00044	-0.00106	-0.00052
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00066	-0.00129	-0.00074
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00278	0.00163	0.00286
sky130_osu_sc_15T_ls__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00044	-0.00106	-0.00052
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00066	-0.00129	-0.00074
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00278	0.00163	0.00286

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02342	0.02255	0.02260
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01126	0.01086	0.01169
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02277	0.02181	0.02350
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01225	0.01183	0.01267
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01455	0.01382	0.01559
sky130_osu_sc_15T_ls__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02342	0.02255	0.02260
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01126	0.01086	0.01169
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02277	0.02181	0.02350
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01225	0.01183	0.01267
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01455	0.01381	0.01563

SKY130_OSU_SC_15T_LS__DFFx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__dff_1	40.29300
sky130_osu_sc_15T_ls__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ls__dff_1	0.00378	0.01093	1.49128	1.49276
sky130_osu_sc_15T_ls__dff_l	0.00378	0.01092	0.83900	0.84399

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__dff_1	0.00000	0.00102	0.00110
sky130_osu_sc_15T_ls__dff_l	0.00000	0.00207	0.00214

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dff_1	CK->Q (RR)	0.20944	1.27086	14.24200
	QN->Q (FR)	0.03475	0.91968	13.47390
sky130_osu_sc_15T_ls__dff_l	CK->Q (RR)	0.21346	1.30944	11.82550
	QN->Q (FR)	0.05034	1.10877	14.11940

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dff_1	CK->Q (RF)	0.31073	1.43172	15.27540
	QN->Q (RF)	0.02279	0.60845	8.88839
sky130_osu_sc_15T_ls__dff_l	CK->Q (RF)	0.32723	1.52455	13.18220
	QN->Q (RF)	0.02227	0.53129	6.91031

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dff_1	CK->QN (RR)	0.27788	0.87099	7.18419
sky130_osu_sc_15T_ls__dff_l	CK->QN (RR)	0.29208	0.99829	7.17869

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__dff_1	CK->QN (RF)	0.16374	0.55027	3.87486
sky130_osu_sc_15T_ls__dff_l	CK->QN (RF)	0.15721	0.50972	2.68172

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dff_1	hold	CK (R)	-0.03975	-0.07414	-0.51482
	setup	CK (R)	0.13761	0.18299	2.38501
sky130_osu_sc_15T_ls__dff_l	hold	CK (R)	-0.03913	-0.07496	-0.51567
	setup	CK (R)	0.13643	0.18261	2.36212

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dff_1	hold	CK (R)	-0.13642	-0.46708	-4.45006
	setup	CK (R)	0.16497	0.48762	6.00965
sky130_osu_sc_15T_ls__dff_l	hold	CK (R)	-0.13767	-0.46708	-4.45156
	setup	CK (R)	0.16580	0.48762	6.00946

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dff_1	min_pulse_width	CK ()	0.08323	0.46265	13.33370
	min_pulse_width	CK ()	0.16329	0.46265	13.33370
sky130_osu_sc_15T_ls__dff_l	min_pulse_width	CK ()	0.07975	0.46265	13.33370
	min_pulse_width	CK ()	0.15981	0.46265	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ls__dff_1	**min_pulse_width**	**CK ()**	0.21202	0.46265	13.33370
	min_pulse_width	**CK ()**	0.13196	0.46265	13.33370
sky130_osu_sc_15T_ls__dff_l	**min_pulse_width**	**CK ()**	0.21202	0.46265	13.33370
	min_pulse_width	**CK ()**	0.12848	0.46265	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00803	0.00557	0.00000
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00727	0.00549	0.00000

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00883	0.00788	0.00000
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00801	0.00681	0.00000

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00883	0.00790	0.00000
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00802	0.00680	0.00000

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00556	0.00000
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00723	0.00549	0.00000

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00215	-0.00231	-0.00230
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00828	0.00790	0.00792
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00215	-0.00231	-0.00230
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00829	0.00790	0.00792

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00228	0.00231	0.00230
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01500	0.01464	0.01454
sky130_osu_sc_15T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00228	0.00231	0.00230
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01501	0.01465	0.01454

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00043	-0.00106	-0.00051
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00065	-0.00128	-0.00072
sky130_osu_sc_15T_ls__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00043	-0.00106	-0.00051
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00064	-0.00128	-0.00072

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01119	0.01081	0.01163
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02261	0.02180	0.02193
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02310	0.02209	0.02376
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01217	0.01176	0.01258
sky130_osu_sc_15T_ls__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01119	0.01080	0.01163
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02261	0.02181	0.02194
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02311	0.02209	0.02380
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01217	0.01176	0.01258

SKY130_OSU_SC_15T_LS__INVx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__inv_1	5.49450
sky130_osu_sc_15T_ls__inv_10	27.47250
sky130_osu_sc_15T_ls__inv_2	7.93650
sky130_osu_sc_15T_ls__inv_3	10.37850
sky130_osu_sc_15T_ls__inv_4	12.82050
sky130_osu_sc_15T_ls__inv_6	17.70450
sky130_osu_sc_15T_ls__inv_8	22.58850
sky130_osu_sc_15T_ls__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ls__inv_1	0.00370	1.41803
sky130_osu_sc_15T_ls__inv_10	0.03392	12.92706
sky130_osu_sc_15T_ls__inv_2	0.00697	2.82106
sky130_osu_sc_15T_ls__inv_3	0.01037	4.01554
sky130_osu_sc_15T_ls__inv_4	0.01368	5.41426
sky130_osu_sc_15T_ls__inv_6	0.02050	8.08511
sky130_osu_sc_15T_ls__inv_8	0.02721	10.63509
sky130_osu_sc_15T_ls__inv_l	0.00286	0.83499

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__inv_1	0.00000	0.00012	0.00019
sky130_osu_sc_15T_ls__inv_10	0.00000	0.00124	0.00193
sky130_osu_sc_15T_ls__inv_2	0.00000	0.00025	0.00039
sky130_osu_sc_15T_ls__inv_3	0.00000	0.00037	0.00058
sky130_osu_sc_15T_ls__inv_4	0.00000	0.00050	0.00077
sky130_osu_sc_15T_ls__inv_6	0.00000	0.00074	0.00116
sky130_osu_sc_15T_ls__inv_8	0.00000	0.00099	0.00155
sky130_osu_sc_15T_ls__inv_l	0.00000	0.00065	0.00120

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__inv_1	**A->Y (FR)**	0.03330	0.85607	12.44440
sky130_osu_sc_15T_ls__inv_10	**A->Y (FR)**	0.04760	0.60228	12.38970
sky130_osu_sc_15T_ls__inv_2	**A->Y (FR)**	0.02660	0.74367	12.39120
sky130_osu_sc_15T_ls__inv_3	**A->Y (FR)**	0.02928	0.69672	12.35400
sky130_osu_sc_15T_ls__inv_4	**A->Y (FR)**	0.02986	0.66465	12.33680
sky130_osu_sc_15T_ls__inv_6	**A->Y (FR)**	0.03409	0.63106	12.42820
sky130_osu_sc_15T_ls__inv_8	**A->Y (FR)**	0.04034	0.61187	12.42010
sky130_osu_sc_15T_ls__inv_l	**A->Y (FR)**	0.04383	0.97486	12.45300

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__inv_1	**A->Y (RF)**	0.02001	0.52217	7.57674
sky130_osu_sc_15T_ls__inv_10	**A->Y (RF)**	0.03022	0.34469	7.58762
sky130_osu_sc_15T_ls__inv_2	**A->Y (RF)**	0.01672	0.45174	7.59957
sky130_osu_sc_15T_ls__inv_3	**A->Y (RF)**	0.01836	0.42669	7.64478
sky130_osu_sc_15T_ls__inv_4	**A->Y (RF)**	0.01839	0.40142	7.63640
sky130_osu_sc_15T_ls__inv_6	**A->Y (RF)**	0.02235	0.37399	7.69700
sky130_osu_sc_15T_ls__inv_8	**A->Y (RF)**	0.02622	0.35878	7.68495
sky130_osu_sc_15T_ls__inv_l	**A->Y (RF)**	0.02008	0.47100	6.04150

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__inv_1	A	0.00000	0.00000	0.00000
	A	0.00385	0.00358	0.00392
sky130_osu_sc_15T_ls__inv_10	A	0.00000	0.00000	0.00000
	A	0.03236	0.03308	0.03485
sky130_osu_sc_15T_ls__inv_2	A	0.00000	0.00000	0.00000
	A	0.00679	0.00681	0.00712
sky130_osu_sc_15T_ls__inv_3	A	0.00000	0.00000	0.00000
	A	0.01043	0.00981	0.01094
sky130_osu_sc_15T_ls__inv_4	A	0.00000	0.00000	0.00000
	A	0.01336	0.01347	0.01414
sky130_osu_sc_15T_ls__inv_6	A	0.00000	0.00000	0.00000
	A	0.01978	0.01996	0.02109
sky130_osu_sc_15T_ls__inv_8	A	0.00000	0.00000	0.00000
	A	0.02611	0.02578	0.02800
sky130_osu_sc_15T_ls__inv_l	A	0.00000	0.00000	0.00000
	A	0.00293	0.00286	0.00297

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00066	-0.00069	-0.00067
sky130_osu_sc_15T_ls__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01209	-0.01159	-0.00982
sky130_osu_sc_15T_ls__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00220	-0.00221	-0.00206
sky130_osu_sc_15T_ls__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00291	-0.00289	-0.00263
sky130_osu_sc_15T_ls__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00457	-0.00443	-0.00403
sky130_osu_sc_15T_ls__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00696	-0.00680	-0.00599
sky130_osu_sc_15T_ls__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00951	-0.00920	-0.00794
sky130_osu_sc_15T_ls__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00049	-0.00044

SKY130_OSU_SC_15T_LS__MUX2

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_15T_ls__mux2_1	0.09451	0.09436	0.00757	0.08887

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__mux2_1	0.00000	0.00039	0.00058

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__mux2_1	A0->Y (RR)	-	0.01560	0.30045	2.74876
	A1->Y (RR)	-	0.01786	0.30274	2.75178
	S0->Y (RR)	(!A0 * A1)	0.04730	0.23663	0.21648
	S0->Y (FR)	(A0 * !A1)	0.04212	0.44313	3.55649

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__mux2_1	A0->Y (FF)	-	0.01594	0.23522	2.06201
	A1->Y (FF)	-	0.01484	0.23291	2.05625
	S0->Y (FF)	(!A0 * A1)	0.07226	0.42290	2.93599
	S0->Y (RF)	(A0 * !A1)	0.02295	0.22644	1.08981

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00408	-0.00408	-0.00409
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00270	-0.00270	-0.00271
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00488	0.00457	0.00567
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00251	-0.00305	-0.00230

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00408	0.00408	0.00409
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00270	0.00270	0.00271
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00082	0.00030	0.00110
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01047	0.01014	0.01108

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00103	-0.00103	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00103	0.00103	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00123	-0.00123	-0.00123

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00123	0.00123	0.00123

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00087	-0.00135	-0.00060
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00083	-0.00134	-0.00061

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00795	0.00767	0.00860
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00739	0.00712	0.00816

SKY130_OSU_SC_15T_LS__NAND2x

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__nand2_1	7.93650
sky130_osu_sc_15T_ls__nand2_1	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__nand2_1	0.00370	0.00366	1.40314
sky130_osu_sc_15T_ls__nand2_1	0.00286	0.00285	0.83006

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__nand2_1	0.00000	0.00014	0.00039
sky130_osu_sc_15T_ls__nand2_1	0.00000	0.00066	0.00241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__nand2_1	A->Y (FR)	0.03483	0.86150	12.44380
	B->Y (FR)	0.04120	0.85177	12.24900
sky130_osu_sc_15T_ls__nand2_l	A->Y (FR)	0.04538	0.97952	12.45250
	B->Y (FR)	0.05482	0.98196	12.42650

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__nand2_1	A->Y (RF)	0.02773	0.62571	9.00484
	B->Y (RF)	0.03193	0.63408	9.00964
sky130_osu_sc_15T_ls__nand2_l	A->Y (RF)	0.02722	0.56191	7.15194
	B->Y (RF)	0.03086	0.56699	7.10988

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00410	0.00384	0.00416
	B	0.00000	0.00000	0.00000
	B	0.00520	0.00482	0.00522
sky130_osu_sc_15T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00309	0.00301	0.00311
	B	0.00000	0.00000	0.00000
	B	0.00393	0.00382	0.00392

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00034	-0.00042	-0.00040
	B	0.00000	0.00000	0.00000
	B	-0.00031	-0.00038	-0.00038
sky130_osu_sc_15T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00026	-0.00031	-0.00028
	B	0.00000	0.00000	0.00000
	B	-0.00025	-0.00030	-0.00029

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00269	-0.00270	-0.00272
sky130_osu_sc_15T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00193	-0.00194	-0.00194

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00271	0.00278	0.00272
sky130_osu_sc_15T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00195	0.00199	0.00195

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00246	-0.00248	-0.00247
sky130_osu_sc_15T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00177	-0.00179	-0.00178

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00248	0.00248	0.00248
sky130_osu_sc_15T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00179	0.00179	0.00178

SKY130_OSU_SC_15T_LS__NOR2x

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__nor2_1	7.93650
sky130_osu_sc_15T_ls__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__nor2_1	0.00365	0.00396	0.72167
sky130_osu_sc_15T_ls__nor2_l	0.00275	0.00308	0.46898

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__nor2_1	0.00000	0.00014	0.00019
sky130_osu_sc_15T_ls__nor2_l	0.00000	0.00067	0.00120

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__nor2_1	A->Y (FR)	0.07495	1.05645	12.55590
	B->Y (FR)	0.05972	1.02118	12.36470
sky130_osu_sc_15T_ls__nor2_l	A->Y (FR)	0.08942	1.17957	12.46780
	B->Y (FR)	0.07603	1.15284	12.45170

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__nor2_1	A->Y (RF)	0.02556	0.43471	5.28806
	B->Y (RF)	0.02112	0.42420	5.27281
sky130_osu_sc_15T_ls__nor2_l	A->Y (RF)	0.02410	0.39667	4.28115
	B->Y (RF)	0.02106	0.38968	4.26818

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00536	0.00530	0.00529
	B	0.00000	0.00000	0.00000
	B	0.00424	0.00411	0.00421
sky130_osu_sc_15T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00389	0.00382	0.00383
	B	0.00000	0.00000	0.00000
	B	0.00318	0.00306	0.00319

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00049	0.00031	0.00027
	B	0.00000	0.00000	0.00000
	B	-0.00053	-0.00056	-0.00059
sky130_osu_sc_15T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00029	0.00019	0.00023
	B	0.00000	0.00000	0.00000
	B	-0.00033	-0.00036	-0.00032

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00216	-0.00232	-0.00232
sky130_osu_sc_15T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00150	-0.00160	-0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00231	0.00233	0.00232
sky130_osu_sc_15T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00159	0.00160	0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00117	-0.00120	-0.00118
sky130_osu_sc_15T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00081	-0.00083	-0.00081

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00124	0.00126	0.00120
sky130_osu_sc_15T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00085	0.00086	0.00083

SKY130_OSU_SC_15T_LS__OAI21

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ls__oai21_l	0.00369	0.00375	0.00323	0.70684

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__oai21_l	0.00000	0.00055	0.00140

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__oai21_l	A0->Y (FR)	0.08423	1.05841	12.45130
	A1->Y (FR)	0.10426	1.09794	12.65230
	B0->Y (FR)	0.05290	0.88668	10.97070

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__oai21_l	A0->Y (RF)	0.03830	0.52390	6.23808
	A1->Y (RF)	0.04299	0.51989	6.14210
	B0->Y (RF)	0.03033	0.53626	6.58793

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00577	0.00561	0.00567
	A1	0.00000	0.00000	0.00000
	A1	0.00693	0.00681	0.00679
	B0	0.00466	0.00448	0.00455

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00027	0.00020	0.00015
	A1	0.00000	0.00000	0.00000
	A1	0.00130	0.00111	0.00106
	B0	0.00178	0.00169	0.00167

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00118	-0.00120	-0.00118
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00226	-0.00235	-0.00234
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00239	-0.00240	-0.00240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00125	0.00126	0.00121
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00233	0.00235	0.00234
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00239	0.00241	0.00240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00210	-0.00226	-0.00226
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00223	-0.00232	-0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00236	-0.00236	-0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00225	0.00226	0.00226
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00230	0.00232	0.00231
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00236	0.00241	0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00199	-0.00200	-0.00203

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00203	0.00204	0.00204

SKY130_OSU_SC_15T_LS__OAI22

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ls__oai22_1	0.00354	0.00378	0.00392	0.00380	0.72309

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__oai22_1	0.00000	0.00023	0.00039

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__oai22_l	A0->Y (FR)	0.11350	1.09895	12.62230
	A1->Y (FR)	0.09766	1.06219	12.43370
	B0->Y (FR)	0.06642	1.03087	12.41300
	B1->Y (FR)	0.08366	1.06824	12.60780

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__oai22_l	A0->Y (RF)	0.05905	0.55656	6.36986
	A1->Y (RF)	0.04913	0.54213	6.33113
	B0->Y (RF)	0.04102	0.55289	6.68588
	B1->Y (RF)	0.05166	0.57227	6.77952

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	A0	0.00893	0.00883	0.00880
	A1	0.00774	0.00756	0.00762
	B0	0.00569	0.00554	0.00560
	B1	0.00693	0.00681	0.00678

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	A0	0.00198	0.00180	0.00173
	A1	0.00105	0.00096	0.00088
	B0	0.00105	0.00095	0.00089
	B1	0.00201	0.00182	0.00176

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00216	-0.00232	-0.00231
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00216	-0.00232	-0.00231
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00224	-0.00232	-0.00232
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00236	-0.00238	-0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00231	0.00232	0.00231
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00231	0.00232	0.00231
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00231	0.00233	0.00232
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00236	0.00243	0.00238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00116	-0.00119	-0.00117
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00116	-0.00119	-0.00117
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00221	-0.00230	-0.00230
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00234	-0.00236	-0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00123	0.00125	0.00119
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00123	0.00125	0.00119
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00229	0.00230	0.00230
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00235	0.00236	0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00115	-0.00118	-0.00116
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00115	-0.00118	-0.00116
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00253	-0.00263	-0.00262
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00260	-0.00264	-0.00266

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00122	0.00124	0.00118
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00122	0.00123	0.00118
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00264	0.00266	0.00262
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00267	0.00268	0.00268

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00211	-0.00227	-0.00227
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00211	-0.00227	-0.00227
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00260	-0.00269	-0.00269
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00266	-0.00268	-0.00272

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00226	0.00228	0.00227
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00226	0.00228	0.00227
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00270	0.00272	0.00269
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00272	0.00274	0.00274

SKY130_OSU_SC_15T_LS__OR2x

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__or2_1	10.37850
sky130_osu_sc_15T_ls__or2_2	12.82050
sky130_osu_sc_15T_ls__or2_4	17.70450
sky130_osu_sc_15T_ls__or2_8	27.47250
sky130_osu_sc_15T_ls__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__or2_1	0.00401	0.00379	1.43967
sky130_osu_sc_15T_ls__or2_2	0.00402	0.00379	2.87204
sky130_osu_sc_15T_ls__or2_4	0.00402	0.00379	5.49669
sky130_osu_sc_15T_ls__or2_8	0.00400	0.00380	10.51418
sky130_osu_sc_15T_ls__or2_l	0.00316	0.00291	0.84515

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__or2_1	0.00000	0.00023	0.00030
sky130_osu_sc_15T_ls__or2_2	0.00000	0.00032	0.00050
sky130_osu_sc_15T_ls__or2_4	0.00000	0.00050	0.00088
sky130_osu_sc_15T_ls__or2_8	0.00000	0.00086	0.00166
sky130_osu_sc_15T_ls__or2_l	0.00000	0.00104	0.00138

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__or2_1	A->Y (RR)	0.06938	0.66151	6.94142
	B->Y (RR)	0.06357	0.64287	6.82526
sky130_osu_sc_15T_ls__or2_2	A->Y (RR)	0.07580	0.58625	7.13311
	B->Y (RR)	0.06948	0.56966	7.03920
sky130_osu_sc_15T_ls__or2_4	A->Y (RR)	0.10014	0.57058	7.44330
	B->Y (RR)	0.09382	0.55648	7.37446
sky130_osu_sc_15T_ls__or2_8	A->Y (RR)	0.14697	0.61025	7.92537
	B->Y (RR)	0.14076	0.60046	7.87672
sky130_osu_sc_15T_ls__or2_l	A->Y (RR)	0.07592	0.74112	6.45550
	B->Y (RR)	0.07098	0.72349	6.36674

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__or2_1	A->Y (FF)	0.13351	0.73207	7.02870
	B->Y (FF)	0.11199	0.68798	6.58336
sky130_osu_sc_15T_ls__or2_2	A->Y (FF)	0.16413	0.73050	7.36980
	B->Y (FF)	0.14263	0.69346	6.94607
sky130_osu_sc_15T_ls__or2_4	A->Y (FF)	0.23592	0.79258	7.83689
	B->Y (FF)	0.21444	0.75917	7.44389
sky130_osu_sc_15T_ls__or2_8	A->Y (FF)	0.37912	0.94598	8.37019
	B->Y (FF)	0.35757	0.90634	8.03314
sky130_osu_sc_15T_ls__or2_l	A->Y (FF)	0.15163	0.71759	5.91075
	B->Y (FF)	0.12720	0.68444	5.63085

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00409	0.00344	0.00372
	B	0.00000	0.00000	0.00000
	B	0.00318	0.00279	0.00354
sky130_osu_sc_15T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.00703	0.00656	0.00704
	B	0.00000	0.00000	0.00000
	B	0.00605	0.00609	0.00676
sky130_osu_sc_15T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.01342	0.01341	0.01380
	B	0.00000	0.00000	0.00000
	B	0.01241	0.01292	0.01395
sky130_osu_sc_15T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.02600	0.02695	0.02848
	B	0.00000	0.00000	0.00000
	B	0.02497	0.02658	0.02916
sky130_osu_sc_15T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00301	0.00255	0.00339
	B	0.00000	0.00000	0.00000
	B	0.00239	0.00217	0.00352

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00917	0.00897	0.00903
	B	0.00000	0.00000	0.00000
	B	0.00777	0.00768	0.00861
sky130_osu_sc_15T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.01132	0.01154	0.01160
	B	0.00000	0.00000	0.00000
	B	0.00993	0.01017	0.01107
sky130_osu_sc_15T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.01652	0.01754	0.01777
	B	0.00000	0.00000	0.00000
	B	0.01512	0.01613	0.01707
sky130_osu_sc_15T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.02697	0.02926	0.03020
	B	0.00000	0.00000	0.00000
	B	0.02554	0.02772	0.02934
sky130_osu_sc_15T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00694	0.00664	0.00694
	B	0.00000	0.00000	0.00000
	B	0.00594	0.00583	0.00705

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00219	-0.00232	-0.00233
sky130_osu_sc_15T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00219	-0.00231	-0.00233
sky130_osu_sc_15T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00219	-0.00232	-0.00233
sky130_osu_sc_15T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00219	-0.00232	-0.00233
sky130_osu_sc_15T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00152	-0.00162	-0.00161

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00232	0.00236	0.00233
sky130_osu_sc_15T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00232	0.00231	0.00233
sky130_osu_sc_15T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00232	0.00232	0.00233
sky130_osu_sc_15T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00232	0.00232	0.00233
sky130_osu_sc_15T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00161	0.00162	0.00161

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00118	-0.00120	-0.00118
sky130_osu_sc_15T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00118	-0.00120	-0.00118
sky130_osu_sc_15T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00118	-0.00120	-0.00118
sky130_osu_sc_15T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00118	-0.00120	-0.00118
sky130_osu_sc_15T_ls__or2_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_15T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00126	0.00127	0.00121
sky130_osu_sc_15T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00126	0.00127	0.00121
sky130_osu_sc_15T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00126	0.00127	0.00121
sky130_osu_sc_15T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00126	0.00127	0.00121
sky130_osu_sc_15T_ls__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00088	0.00089	0.00085

SKY130_OSU_SC_15T_LS__TBUFIx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__tbufi_1	10.37850
sky130_osu_sc_15T_ls__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ls__tbufi_1	0.00394	0.00513	0.73335
sky130_osu_sc_15T_ls__tbufi_l	0.00308	0.00405	0.46128

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__tbufi_1	0.00000	0.00016	0.00039
sky130_osu_sc_15T_ls__tbufi_l	0.00000	0.00070	0.00241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__tbufi_1	A->Y (FR)	0.05616	1.01905	12.41790
	OE->Y (FR)	0.05206	0.34955	4.59493
	OE->Y (RR)	0.09004	0.81266	6.98541
sky130_osu_sc_15T_ls__tbufi_l	A->Y (FR)	0.07283	1.14330	12.33900
	OE->Y (FR)	0.06035	0.36461	4.59480
	OE->Y (RR)	0.10083	0.90140	6.42345

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__tbufi_1	A->Y (RF)	0.02660	0.50526	6.27615
	OE->Y (FF)	0.05234	0.35174	4.59498
	OE->Y (RF)	0.02727	0.50836	6.25652
sky130_osu_sc_15T_ls__tbufi_l	A->Y (RF)	0.02663	0.45908	5.01661
	OE->Y (FF)	0.06104	0.36454	4.59478
	OE->Y (RF)	0.02674	0.46118	5.02467

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00392	0.00379	0.00387
	OE	0.00000	0.00000	0.00000
	OE	0.00385	0.00336	0.00430
sky130_osu_sc_15T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00296	0.00282	0.00294
	OE	0.00000	0.00000	0.00000
	OE	0.00275	0.00248	0.00391

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00054	-0.00057	-0.00059
	OE	0.00000	0.00000	0.00000
	OE	0.00262	0.00211	0.00300
sky130_osu_sc_15T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00033	-0.00036	-0.00032
	OE	0.00000	0.00000	0.00000
	OE	0.00179	0.00144	0.00302

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00195	-0.00197	-0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00178	-0.00180	-0.00179
sky130_osu_sc_15T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00145	-0.00146	-0.00146
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00135	-0.00135	-0.00135

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00195	0.00197	0.00196
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00184	0.00186	0.00182
sky130_osu_sc_15T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00145	0.00146	0.00146
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00138	0.00139	0.00136

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00148	0.00098	0.00186
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00133	0.00084	0.00171
sky130_osu_sc_15T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00100	0.00064	0.00224
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00090	0.00056	0.00213

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00455	0.00413	0.00518
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00471	0.00428	0.00528
sky130_osu_sc_15T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00357	0.00329	0.00477
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00370	0.00339	0.00484

SKY130_OSU_SC_15T_LS__TNBUFIx

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__tnbufi_1	10.37850
sky130_osu_sc_15T_ls__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ls__tnbufi_1	0.00394	0.00591	0.71769
sky130_osu_sc_15T_ls__tnbufi_l	0.00307	0.00440	0.46418

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__tnbufi_1	0.00000	0.00021	0.00025
sky130_osu_sc_15T_ls__tnbufi_l	0.00000	0.00107	0.00129

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__tnbufi_1	A->Y (FR)	0.05681	1.01068	12.26140
	OE->Y (RR)	0.02511	0.31329	4.59535
	OE->Y (FR)	0.06972	1.04375	12.44910
sky130_osu_sc_15T_ls__tnbufi_l	A->Y (FR)	0.07327	1.14581	12.38470
	OE->Y (RR)	0.02382	0.31328	4.59531
	OE->Y (FR)	0.08470	1.17203	12.39970

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ls__tnbufi_1	A->Y (RF)	0.02612	0.50160	6.20066
	OE->Y (RF)	0.02479	0.31328	4.59532
	OE->Y (FF)	0.05885	0.57420	5.17995
sky130_osu_sc_15T_ls__tnbufi_l	A->Y (RF)	0.02605	0.45967	5.03602
	OE->Y (RF)	0.02346	0.31329	4.59536
	OE->Y (FF)	0.06540	0.56802	4.66945

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00405	0.00392	0.00400
	OE	0.00000	0.00000	0.00000
	OE	0.00972	0.00951	0.01083
sky130_osu_sc_15T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00309	0.00294	0.00307
	OE	0.00000	0.00000	0.00000
	OE	0.00719	0.00705	0.00880

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00069	-0.00073	-0.00074
	OE	0.00000	0.00000	0.00000
	OE	0.00867	0.00847	0.00966
sky130_osu_sc_15T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00049	-0.00052	-0.00048
	OE	0.00000	0.00000	0.00000
	OE	0.00634	0.00620	0.00774

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00164	-0.00165	-0.00165
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00148	-0.00150	-0.00149
sky130_osu_sc_15T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00115	-0.00116	-0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00106	-0.00106	-0.00105

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00164	0.00165	0.00165
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00153	0.00155	0.00152
sky130_osu_sc_15T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00115	0.00116	0.00116
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00108	0.00109	0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00272	-0.00339	-0.00245
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00259	-0.00330	-0.00243
sky130_osu_sc_15T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00182	-0.00227	-0.00063
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00172	-0.00222	-0.00061

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00737	0.00723	0.00843
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00726	0.00707	0.00831
sky130_osu_sc_15T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00544	0.00530	0.00701
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00535	0.00522	0.00693

SKY130_OSU_SC_15T_LS__XNOR2

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__xnor2_l	0.00780	0.00686	0.74666

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__xnor2_l	0.00000	0.00046	0.00063

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__xnor2_l	A->Y (RR)	B	0.11530	0.85784	7.20880
	A->Y (FR)	!B	0.07564	1.04351	12.50590
	B->Y (RR)	A	0.09288	0.83087	7.13793
	B->Y (FR)	!A	0.09739	1.07997	12.69480

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__xnor2_l	A->Y (FF)	B	0.09284	0.64254	5.53929
	A->Y (RF)	!B	0.03754	0.51928	6.31404
	B->Y (FF)	A	0.08566	0.63531	5.54120
	B->Y (RF)	!A	0.04308	0.52723	6.31935

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00395	0.00349	0.00419
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00975	0.00926	0.01035
	B	A	0.00000	0.00000	0.00000
	B	A	0.00178	0.00134	0.00225
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01040	0.01003	0.01113

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01185	0.01120	0.01205
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00285	0.00227	0.00303
	B	A	0.00000	0.00000	0.00000
	B	A	0.01089	0.01068	0.01176
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00351	0.00285	0.00360

SKY130_OSU_SC_15T_LS__XOR2

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ls__xor2_l	0.00782	0.00691	0.73269

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__xor2_l	0.00000	0.00046	0.00055

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__xor2_l	A->Y (RR)	!B	0.11708	0.84990	7.14464
	A->Y (FR)	B	0.09057	1.07540	12.69800
	B->Y (RR)	!A	0.09811	0.84019	7.14682
	B->Y (FR)	A	0.09934	1.08540	12.68910

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ls__xor2_l	A->Y (FF)	!B	0.09086	0.64437	5.55139
	A->Y (RF)	B	0.03541	0.52151	6.28546
	B->Y (FF)	!A	0.08349	0.63301	5.50128
	B->Y (RF)	A	0.04305	0.52626	6.26602

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01140	0.01100	0.01211
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00234	0.00121	0.00196
	B	A	0.00000	0.00000	0.00000
	B	A	0.01159	0.01125	0.01235
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00163	0.00115	0.00206

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00223	0.00151	0.00223
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01250	0.01221	0.01317
	B	A	0.00000	0.00000	0.00000
	B	A	0.00227	0.00156	0.00231
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01109	0.01093	0.01200

SKY130_OSU_SC_15T_LS_x

sky130_osu_sc_15T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ls__ant	5.49450
sky130_osu_sc_15T_ls__tiehi	5.49450
sky130_osu_sc_15T_ls__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ls__ant	0.29363
sky130_osu_sc_15T_ls__tiehi	0.00000
sky130_osu_sc_15T_ls__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ls__ant	0.00000	142656.00000	285312.00000
sky130_osu_sc_15T_ls__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_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_15T_ls__ant	0.00000	0.00000	0.00000
	-0.00192	0.02438	0.36762

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ls__ant	0.00000	0.00000	0.00000
	2.48341	2.35390	0.47819