sky130_osu_sc_12T_ls_ff_1P56_-40C.ccs Library

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

SKY130_OSU_SC_12T_LS__ADDFx

sky130_osu_sc_12T_ls_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_12T_ls__addf_1	31.25760
sky130_osu_sc_12T_ls__addf_l	31.25760

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_12T_ls__addf_1	0.01053	0.01057	0.00820	0.96138	0.42190	0.85929
sky130_osu_sc_12T_ls__addf_l	0.01052	0.01057	0.00821	0.60375	0.42696	0.85928

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__addf_1	0.00000	0.00322	0.00396
sky130_osu_sc_12T_ls__addf_l	0.00000	0.00269	0.00395

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CO (RR)	0.13162	1.47180	19.92800
	B->CO (RR)	0.12304	1.40570	19.18000
	CI->CO (RR)	0.12430	1.48024	20.24410
	CON->CO (FR)	0.03180	0.84472	12.62160
sky130_osu_sc_12T_ls__addf_1	A->CO (RR)	0.13691	1.39070	16.07320
	B->CO (RR)	0.12841	1.34310	15.77580
	CI->CO (RR)	0.12966	1.40160	16.47550
	CON->CO (FR)	0.04056	0.92916	12.36140

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CO (FF)	0.27015	2.35134	30.99850
	B->CO (FF)	0.23946	2.23682	29.78990
	CI->CO (FF)	0.23867	2.31349	31.02020
	CON->CO (RF)	0.01698	0.44040	6.56703
sky130_osu_sc_12T_ls__addf_1	A->CO (FF)	0.26159	1.98721	22.38210
	B->CO (FF)	0.23193	1.89356	21.62730
	CI->CO (FF)	0.23050	1.94898	22.42160
	CON->CO (RF)	0.01851	0.43687	5.82010

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CON (FR)	0.22962	1.22185	12.53110
	B->CON (FR)	0.19916	1.14957	12.12470
	CI->CON (FR)	0.19827	1.18446	12.58110
sky130_osu_sc_12T_ls__addf_1	A->CON (FR)	0.21899	1.21661	12.60240
	B->CON (FR)	0.18931	1.14468	12.19740
	CI->CON (FR)	0.18760	1.17919	12.65890

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->CON (RF)	0.06608	0.45003	4.86834
	B->CON (RF)	0.05487	0.43271	4.80373
	CI->CON (RF)	0.05878	0.46209	5.11092
sky130_osu_sc_12T_ls__addf_1	A->CON (RF)	0.06406	0.44946	4.90036
	B->CON (RF)	0.05307	0.43212	4.83451
	CI->CON (RF)	0.05674	0.46170	5.14547

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->S (-R)	0.38251	2.32786	25.75060
	B->S (-R)	0.36386	2.27193	25.11550
	CI->S (-R)	0.34931	2.28579	25.76390
	CON->S (RR)	0.08347	0.72969	7.13466
sky130_osu_sc_12T_ls__addf_1	A->S (-R)	0.36874	2.31763	25.73900
	B->S (-R)	0.35081	2.26218	25.10670
	CI->S (-R)	0.33573	2.27575	25.75490
	CON->S (RR)	0.08353	0.72958	7.13063

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addf_1	A->S (-F)	0.24001	1.21008	12.38080
	B->S (-F)	0.26077	1.18796	12.14900
	CI->S (-F)	0.23253	1.21601	12.71230
	CON->S (FF)	0.11641	0.65166	6.00186
sky130_osu_sc_12T_ls__addf_l	A->S (-F)	0.23497	1.20581	12.37780
	B->S (-F)	0.25641	1.18447	12.14600
	CI->S (-F)	0.22752	1.21199	12.70900
	CON->S (FF)	0.11639	0.65161	6.00164

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00211	0.00202	0.00214
	B	0.00247	0.00247	0.00261
	CI	0.00253	0.00259	0.00284
sky130_osu_sc_12T_ls__addf_l	A	0.00192	0.00182	0.00184
	B	0.00228	0.00225	0.00233
	CI	0.00235	0.00240	0.00257

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00626	0.00631	0.00756
	B	0.00649	0.00657	0.00757
	CI	0.00572	0.00587	0.00689
sky130_osu_sc_12T_ls__addf_l	A	0.00649	0.00648	0.00694
	B	0.00633	0.00639	0.00690
	CI	0.00555	0.00567	0.00624

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00664	0.00657	0.00688
	B	0.00648	0.00651	0.00683
	CI	0.00571	0.00581	0.00617
sky130_osu_sc_12T_ls__addf_l	A	0.00649	0.00641	0.00672
	B	0.00633	0.00636	0.00667
	CI	0.00555	0.00566	0.00600

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00209	0.00198	0.00202
	B	0.00245	0.00240	0.00239
	CI	0.00253	0.00257	0.00263
sky130_osu_sc_12T_ls__addf_l	A	0.00191	0.00180	0.00181
	B	0.00226	0.00221	0.00223
	CI	0.00234	0.00238	0.00245

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.00626	0.00630	0.00744
	B	0.00649	0.00657	0.00743
	CI	0.00572	0.00586	0.00676
sky130_osu_sc_12T_ls__addf_l	A	0.00611	0.00614	0.00728
	B	0.00634	0.00641	0.00726
	CI	0.00555	0.00569	0.00660

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addf_1	A	0.01355	0.01352	0.01363
	B	0.01243	0.01191	0.01290
	CI	0.01116	0.01098	0.01122
sky130_osu_sc_12T_ls__addf_l	A	0.01355	0.01352	0.01363
	B	0.01243	0.01191	0.01290
	CI	0.01116	0.01098	0.01122

SKY130_OSU_SC_12T_LS__ADDHx

sky130_osu_sc_12T_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	0	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__addh_1	18.55920
sky130_osu_sc_12T_ls__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ls__addh_1	0.00517	0.00544	0.92252	0.94366	0.95909
sky130_osu_sc_12T_ls__addh_l	0.00517	0.00544	0.60671	0.94417	0.61737

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__addh_1	0.00000	0.00346	0.00388
sky130_osu_sc_12T_ls__addh_l	0.00000	0.00240	0.00283

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CO (RR)	0.09335	0.69864	6.70685
	B->CO (RR)	0.09607	0.70804	6.81848
sky130_osu_sc_12T_ls__addh_l	A->CO (RR)	0.09774	0.78017	6.64122
	B->CO (RR)	0.10049	0.79076	6.75561

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CO (FF)	0.09676	0.63312	6.24694
	B->CO (FF)	0.10261	0.64867	6.32356
sky130_osu_sc_12T_ls__addh_l	A->CO (FF)	0.09432	0.63230	5.76493
	B->CO (FF)	0.09994	0.64554	5.85382

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CON (RR)	0.14117	0.72618	6.65606
	B->CON (RR)	0.14392	0.73418	6.76703
sky130_osu_sc_12T_ls__addh_l	A->CON (RR)	0.13132	0.71156	6.60095
	B->CON (RR)	0.13417	0.72048	6.71299

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->CON (FF)	0.12223	0.64957	6.29631
	B->CON (FF)	0.12361	0.66145	6.37172
sky130_osu_sc_12T_ls__addh_l	A->CON (FF)	0.11405	0.63626	6.17407
	B->CON (FF)	0.11526	0.64574	6.27293

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->S (FR)	0.17729	1.39914	16.52890
	B->S (FR)	0.17923	1.41056	16.61900
	CON->S (FR)	0.03367	0.85331	12.73430
sky130_osu_sc_12T_ls__addh_l	A->S (FR)	0.17484	1.37241	14.06430
	B->S (FR)	0.17662	1.38193	14.15290
	CON->S (FR)	0.04131	0.93704	12.55370

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__addh_1	A->S (RF)	0.17443	1.23496	13.61590
	B->S (RF)	0.17718	1.24286	13.72910
	CON->S (RF)	0.01655	0.44051	6.59033
sky130_osu_sc_12T_ls__addh_l	A->S (RF)	0.16623	1.06053	9.37798
	B->S (RF)	0.16901	1.06916	9.49209
	CON->S (RF)	0.01803	0.44050	5.93434

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00333	0.00313	0.00353
	B	0.00000	0.00000	0.00000
	B	0.00309	0.00290	0.00298
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00297	0.00274	0.00342
	B	0.00000	0.00000	0.00000
	B	0.00274	0.00252	0.00273

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00458	0.00438	0.00443
	B	0.00000	0.00000	0.00000
	B	0.00482	0.00480	0.00487
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00421	0.00403	0.00426
	B	0.00000	0.00000	0.00000
	B	0.00446	0.00442	0.00467

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00333	0.00313	0.00332
	B	0.00000	0.00000	0.00000
	B	0.00309	0.00290	0.00295
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00297	0.00275	0.00304
	B	0.00000	0.00000	0.00000
	B	0.00273	0.00252	0.00322

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00458	0.00438	0.00452
	B	0.00000	0.00000	0.00000
	B	0.00482	0.00480	0.00484
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00421	0.00401	0.00415
	B	0.00000	0.00000	0.00000
	B	0.00446	0.00442	0.00455

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00458	0.00439	0.00460
	B	0.00000	0.00000	0.00000
	B	0.00482	0.00481	0.00505
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00422	0.00403	0.00433
	B	0.00000	0.00000	0.00000
	B	0.00446	0.00443	0.00474

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	A	0.00000	0.00000	0.00000
	A	0.00332	0.00313	0.00339
	B	0.00000	0.00000	0.00000
	B	0.00309	0.00290	0.00302
sky130_osu_sc_12T_ls__addh_l	A	0.00000	0.00000	0.00000
	A	0.00297	0.00275	0.00311
	B	0.00000	0.00000	0.00000
	B	0.00274	0.00252	0.00270

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.72832	0.69516	0.16933
sky130_osu_sc_12T_ls__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.72835	0.69519	0.16936

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.72819	0.69454	0.16869
sky130_osu_sc_12T_ls__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.72822	0.69459	0.16872

SKY130_OSU_SC_12T_LS__AND2x

sky130_osu_sc_12T_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_12T_ls__and2_1	8.30280
sky130_osu_sc_12T_ls__and2_2	10.25640
sky130_osu_sc_12T_ls__and2_4	14.16360
sky130_osu_sc_12T_ls__and2_6	18.07080
sky130_osu_sc_12T_ls__and2_8	21.97800
sky130_osu_sc_12T_ls__and2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__and2_1	0.00278	0.00287	0.92145
sky130_osu_sc_12T_ls__and2_2	0.00278	0.00288	1.84264
sky130_osu_sc_12T_ls__and2_4	0.00277	0.00288	3.61351
sky130_osu_sc_12T_ls__and2_6	0.00281	0.00288	5.30679
sky130_osu_sc_12T_ls__and2_8	0.00278	0.00288	6.92695
sky130_osu_sc_12T_ls__and2_l	0.00216	0.00223	0.60455

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__and2_1	0.00000	0.00159	0.00250
sky130_osu_sc_12T_ls__and2_2	0.00000	0.00251	0.00258
sky130_osu_sc_12T_ls__and2_4	0.00000	0.00436	0.00493
sky130_osu_sc_12T_ls__and2_6	0.00000	0.00621	0.00733
sky130_osu_sc_12T_ls__and2_8	0.00000	0.00806	0.00974
sky130_osu_sc_12T_ls__and2_l	0.00000	0.00027	0.00039

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__and2_1	A->Y (RR)	0.07178	0.64075	6.36234
	B->Y (RR)	0.07603	0.65493	6.48464
sky130_osu_sc_12T_ls__and2_2	A->Y (RR)	0.07867	0.55940	6.54118
	B->Y (RR)	0.08286	0.56993	6.64876
sky130_osu_sc_12T_ls__and2_4	A->Y (RR)	0.10662	0.54724	6.96516
	B->Y (RR)	0.11077	0.55203	7.06204
sky130_osu_sc_12T_ls__and2_6	A->Y (RR)	0.13488	0.56459	7.18339
	B->Y (RR)	0.13882	0.56636	7.27078
sky130_osu_sc_12T_ls__and2_8	A->Y (RR)	0.16200	0.58884	7.39159
	B->Y (RR)	0.16642	0.58986	7.47052
sky130_osu_sc_12T_ls__and2_l	A->Y (RR)	0.08098	0.72231	6.15391
	B->Y (RR)	0.08498	0.73457	6.25050

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__and2_1	A->Y (FF)	0.07553	0.57156	5.74022
	B->Y (FF)	0.07937	0.58415	5.82740
sky130_osu_sc_12T_ls__and2_2	A->Y (FF)	0.09049	0.56778	6.02324
	B->Y (FF)	0.09332	0.57593	6.09515
sky130_osu_sc_12T_ls__and2_4	A->Y (FF)	0.12977	0.60545	6.46642
	B->Y (FF)	0.12975	0.60852	6.52116
sky130_osu_sc_12T_ls__and2_6	A->Y (FF)	0.17071	0.64946	6.75499
	B->Y (FF)	0.16766	0.64717	6.77726
sky130_osu_sc_12T_ls__and2_8	A->Y (FF)	0.20891	0.69039	6.96741
	B->Y (FF)	0.20331	0.68449	6.97858
sky130_osu_sc_12T_ls__and2_l	A->Y (FF)	0.07989	0.58083	5.33075
	B->Y (FF)	0.08874	0.60005	5.42323

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00226	0.00193	0.00353
	B	0.00000	0.00000	0.00000
	B	0.00231	0.00192	0.00272
sky130_osu_sc_12T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.00419	0.00401	0.00547
	B	0.00000	0.00000	0.00000
	B	0.00424	0.00404	0.00473
sky130_osu_sc_12T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.00853	0.00871	0.00993
	B	0.00000	0.00000	0.00000
	B	0.00857	0.00875	0.00955
sky130_osu_sc_12T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.01288	0.01334	0.01500
	B	0.00000	0.00000	0.00000
	B	0.01291	0.01350	0.01452
sky130_osu_sc_12T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.01712	0.01791	0.01954
	B	0.00000	0.00000	0.00000
	B	0.01722	0.01805	0.01915
sky130_osu_sc_12T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00177	0.00158	0.00322
	B	0.00000	0.00000	0.00000
	B	0.00180	0.00158	0.00258

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	A	0.00000	0.00000	0.00000
	A	0.00572	0.00557	0.00692
	B	0.00000	0.00000	0.00000
	B	0.00652	0.00631	0.00749
sky130_osu_sc_12T_ls__and2_2	A	0.00000	0.00000	0.00000
	A	0.00728	0.00741	0.00871
	B	0.00000	0.00000	0.00000
	B	0.00810	0.00813	0.00926
sky130_osu_sc_12T_ls__and2_4	A	0.00000	0.00000	0.00000
	A	0.01109	0.01174	0.01306
	B	0.00000	0.00000	0.00000
	B	0.01190	0.01243	0.01353
sky130_osu_sc_12T_ls__and2_6	A	0.00000	0.00000	0.00000
	A	0.01501	0.01619	0.01760
	B	0.00000	0.00000	0.00000
	B	0.01576	0.01681	0.01794
sky130_osu_sc_12T_ls__and2_8	A	0.00000	0.00000	0.00000
	A	0.01883	0.02044	0.02202
	B	0.00000	0.00000	0.00000
	B	0.01971	0.02090	0.02224
sky130_osu_sc_12T_ls__and2_l	A	0.00000	0.00000	0.00000
	A	0.00441	0.00428	0.00583
	B	0.00000	0.00000	0.00000
	B	0.00501	0.00486	0.00628

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00191	-0.00193	-0.00192
sky130_osu_sc_12T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00191	-0.00193	-0.00192
sky130_osu_sc_12T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00191	-0.00193	-0.00192
sky130_osu_sc_12T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00193	-0.00195	-0.00194
sky130_osu_sc_12T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00190	-0.00193	-0.00192
sky130_osu_sc_12T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00136	-0.00138	-0.00137

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00192	0.00194	0.00193
sky130_osu_sc_12T_ls__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00192	0.00194	0.00193
sky130_osu_sc_12T_ls__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00192	0.00194	0.00193
sky130_osu_sc_12T_ls__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00194	0.00196	0.00195
sky130_osu_sc_12T_ls__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00192	0.00193	0.00193
sky130_osu_sc_12T_ls__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00137	0.00139	0.00138

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00179	-0.00181	-0.00180
sky130_osu_sc_12T_ls__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00179	-0.00181	-0.00180
sky130_osu_sc_12T_ls__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00179	-0.00180	-0.00180
sky130_osu_sc_12T_ls__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00179	-0.00181	-0.00180
sky130_osu_sc_12T_ls__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00179	-0.00180	-0.00180
sky130_osu_sc_12T_ls__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00129	-0.00129	-0.00129

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__and2_1	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00182	0.00183	0.00180
sky130_osu_sc_12T_ls__and2_2	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00182	0.00183	0.00180
sky130_osu_sc_12T_ls__and2_4	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00182	0.00182	0.00180
sky130_osu_sc_12T_ls__and2_6	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00182	0.00181	0.00180
sky130_osu_sc_12T_ls__and2_8	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00182	0.00181	0.00180
sky130_osu_sc_12T_ls__and2_l	**(!A * !Y)**	0.00000	0.00000	0.00000
	(!A * !Y)	0.00131	0.00131	0.00129

SKY130_OSU_SC_12T_LS__AOI21

sky130_osu_sc_12T_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_12T_ls__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ls__aoi21_l	0.00251	0.00270	0.00268	0.40183

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__aoi21_l	0.00000	0.00068	0.00120

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi21_l	A0->Y (FR)	0.11568	1.12411	12.38150
	A1->Y (FR)	0.09101	1.02470	11.68690
	B0->Y (FR)	0.09145	1.09537	12.52100

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi21_l	A0->Y (RF)	0.03253	0.40459	4.64208
	A1->Y (RF)	0.02908	0.39948	4.61312
	B0->Y (RF)	0.02181	0.38352	4.54395

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00466	0.00458	0.00459
	A1	0.00000	0.00000	0.00000
	A1	0.00388	0.00377	0.00377
	B0	0.00386	0.00373	0.00384

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00082	0.00068	0.00068
	A1	0.00000	0.00000	0.00000
	A1	0.00084	0.00068	0.00073
	B0	-0.00034	-0.00039	-0.00032

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00145	-0.00152	-0.00151
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00155	-0.00155	-0.00155
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00155	-0.00156	-0.00155

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00150	0.00152	0.00151
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00155	0.00156	0.00155
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00157	0.00156	0.00155

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00145	-0.00152	-0.00152
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00155	-0.00156	-0.00155
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00173	-0.00174	-0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00151	0.00153	0.00152
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00155	0.00157	0.00156
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00174	0.00177	0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00076	-0.00077	-0.00076

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00084	0.00085	0.00078

SKY130_OSU_SC_12T_LS__AOI22

sky130_osu_sc_12T_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_12T_ls__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ls__aoi22_l	0.00251	0.00269	0.00284	0.00264	0.39601

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__aoi22_l	0.00000	0.00087	0.00241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi22_l	A0->Y (FR)	0.14944	1.15991	12.36490
	A1->Y (FR)	0.13191	1.13405	12.29690
	B0->Y (FR)	0.09703	1.09202	12.41660
	B1->Y (FR)	0.11503	1.11874	12.49560

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__aoi22_l	A0->Y (RF)	0.04112	0.41402	4.61718
	A1->Y (RF)	0.03766	0.40852	4.58728
	B0->Y (RF)	0.02450	0.38892	4.56417
	B1->Y (RF)	0.02825	0.39510	4.59500

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	A0	0.00582	0.00572	0.00573
	A1	0.00505	0.00488	0.00491
	B0	0.00412	0.00392	0.00404
	B1	0.00490	0.00476	0.00486

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	A0	0.00170	0.00157	0.00154
	A1	0.00172	0.00158	0.00158
	B0	-0.00015	-0.00022	-0.00016
	B1	-0.00013	-0.00019	-0.00018

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00146	-0.00153	-0.00151
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00155	-0.00156	-0.00155
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00154	-0.00155	-0.00155
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00155	-0.00155	-0.00155

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00150	0.00153	0.00151
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00155	0.00156	0.00155
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00157	0.00156	0.00155
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00157	0.00156	0.00155

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00146	-0.00152	-0.00151
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00155	-0.00156	-0.00155
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00172	-0.00173	-0.00174
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00172	-0.00173	-0.00174

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00151	0.00153	0.00151
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00155	0.00156	0.00156
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00173	0.00176	0.00174
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00173	0.00176	0.00174

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00076	-0.00077	-0.00076
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00075	-0.00076	-0.00076
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00181	-0.00183	-0.00183
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00181	-0.00183	-0.00183

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00088	0.00088	0.00079
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00075	0.00076	0.00076
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00182	0.00183	0.00183
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00182	0.00183	0.00183

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00077	-0.00077	-0.00077
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00077	-0.00077	-0.00077
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00164	-0.00165	-0.00164
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00164	-0.00165	-0.00164

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00088	0.00089	0.00080
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00077	0.00077	0.00077
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00166	0.00166	0.00165
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00166	0.00166	0.00165

SKY130_OSU_SC_12T_LS__BUFx

sky130_osu_sc_12T_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_12T_ls__buf_1	6.34920
sky130_osu_sc_12T_ls__buf_2	8.30280
sky130_osu_sc_12T_ls__buf_4	12.21000
sky130_osu_sc_12T_ls__buf_6	16.11720
sky130_osu_sc_12T_ls__buf_8	20.02440
sky130_osu_sc_12T_ls__buf_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ls__buf_1	0.00289	0.87054
sky130_osu_sc_12T_ls__buf_2	0.00289	1.79115
sky130_osu_sc_12T_ls__buf_4	0.00288	3.55658
sky130_osu_sc_12T_ls__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ls__buf_8	0.00289	6.95755
sky130_osu_sc_12T_ls__buf_l	0.00220	0.61111

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__buf_1	0.00000	0.00129	0.00129
sky130_osu_sc_12T_ls__buf_2	0.00000	0.00194	0.00250
sky130_osu_sc_12T_ls__buf_4	0.00000	0.00323	0.00490
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ls__buf_8	0.00000	0.00581	0.00972
sky130_osu_sc_12T_ls__buf_l	0.00000	0.00023	0.00023

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__buf_1	**A->Y (RR)**	0.05977	0.63704	6.42636
sky130_osu_sc_12T_ls__buf_2	**A->Y (RR)**	0.06112	0.53395	6.50474
sky130_osu_sc_12T_ls__buf_4	**A->Y (RR)**	0.08101	0.50663	6.85311
sky130_osu_sc_12T_ls__buf_8	**A->Y (RR)**	0.12135	0.53179	7.28574
sky130_osu_sc_12T_ls__buf_l	**A->Y (RR)**	0.06575	0.69912	6.14872

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__buf_1	**A->Y (FF)**	0.07107	0.55594	5.52632
sky130_osu_sc_12T_ls__buf_2	**A->Y (FF)**	0.08587	0.55826	5.90012
sky130_osu_sc_12T_ls__buf_4	**A->Y (FF)**	0.12499	0.59895	6.38424
sky130_osu_sc_12T_ls__buf_8	**A->Y (FF)**	0.20355	0.68458	6.96115
sky130_osu_sc_12T_ls__buf_l	**A->Y (FF)**	0.07735	0.57458	5.30984

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00213	0.00173	0.00292
sky130_osu_sc_12T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00405	0.00378	0.00507
sky130_osu_sc_12T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.00841	0.00847	0.00973
sky130_osu_sc_12T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.01699	0.01771	0.01945
sky130_osu_sc_12T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00169	0.00143	0.00292

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__buf_1	A	0.00000	0.00000	0.00000
	A	0.00557	0.00535	0.00658
sky130_osu_sc_12T_ls__buf_2	A	0.00000	0.00000	0.00000
	A	0.00712	0.00708	0.00821
sky130_osu_sc_12T_ls__buf_4	A	0.00000	0.00000	0.00000
	A	0.01092	0.01136	0.01245
sky130_osu_sc_12T_ls__buf_8	A	0.00000	0.00000	0.00000
	A	0.01860	0.01985	0.02110
sky130_osu_sc_12T_ls__buf_l	A	0.00000	0.00000	0.00000
	A	0.00437	0.00422	0.00573

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
	-0.00048	-0.00048	-0.00047

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__buf_6	0.00000	0.00000	0.00000
	0.00048	0.00048	0.00047

SKY130_OSU_SC_12T_LS__DFFRx

sky130_osu_sc_12T_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_12T_ls__dffr_1	42.49080
sky130_osu_sc_12T_ls__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ls__dffr_1	0.00263	0.00264	0.00850	0.93211	0.91632
sky130_osu_sc_12T_ls__dffr_l	0.00263	0.00264	0.00849	0.60751	0.60467

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dffr_1	0.00000	0.00423	0.00659
sky130_osu_sc_12T_ls__dffr_l	0.00000	0.00317	0.00553

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->Q (RR)	0.36623	1.34626	12.22860
	QN->Q (FR)	0.03672	0.91982	13.71530
sky130_osu_sc_12T_ls__dffr_l	CK->Q (RR)	0.35996	1.41574	11.31800
	QN->Q (FR)	0.04345	0.98541	13.07510

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->Q (RF)	0.32888	1.36642	13.37950
	QN->Q (RF)	0.01870	0.48805	7.31739
	RN->Q (FF)	0.24195	1.49716	16.74900
sky130_osu_sc_12T_ls__dffr_l	CK->Q (RF)	0.33975	1.48234	12.58230
	QN->Q (RF)	0.01973	0.47685	6.49812
	RN->Q (FF)	0.25328	1.61314	15.94630

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	CK->QN (RR)	0.29930	0.87908	6.70180
	RN->QN (FR)	0.21179	1.01047	10.06930
sky130_osu_sc_12T_ls__dffr_l	CK->QN (RR)	0.30576	0.96560	6.64221
	RN->QN (FR)	0.21878	1.09665	10.00050

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffr_1	**CK->QN (RF)**	0.30554	0.63290	2.60080
sky130_osu_sc_12T_ls__dffr_l	**CK->QN (RF)**	0.29190	0.61846	2.20610

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.04649	-0.07720	-0.41818
	setup	CK (R)	0.28308	0.30861	1.57855
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.05031	-0.07748	-0.41935
	setup	CK (R)	0.28393	0.31006	1.57950

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.15168	-0.42559	-5.75513
	setup	CK (R)	0.17845	0.43854	5.81716
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.15126	-0.42211	-5.75749
	setup	CK (R)	0.17845	0.43854	5.81755

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.04649	-0.07720	-0.41818
	setup	CK (R)	0.28308	0.30861	1.57855
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.05031	-0.07748	-0.41935
	setup	CK (R)	0.28393	0.31006	1.57950

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	hold	CK (R)	-0.15168	-0.42559	-5.75513
	setup	CK (R)	0.17845	0.43854	5.81716
sky130_osu_sc_12T_ls__dffr_l	hold	CK (R)	-0.15126	-0.42211	-5.75749
	setup	CK (R)	0.17845	0.43854	5.81755

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	recovery	CK (R)	0.26289	0.28259	1.53098
	removal	CK (R)	-0.05460	-0.07049	-0.13301
sky130_osu_sc_12T_ls__dffr_l	recovery	CK (R)	0.26043	0.28398	1.52103
	removal	CK (R)	-0.05460	-0.07049	-0.13301

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	recovery	CK (R)	0.26289	0.28259	1.53098
	removal	CK (R)	-0.05460	-0.07049	-0.13301
sky130_osu_sc_12T_ls__dffr_l	recovery	CK (R)	0.26043	0.28398	1.52103
	removal	CK (R)	-0.05460	-0.07049	-0.13301

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	min_pulse_width	RN ()	0.15301	0.42182	13.33370
	min_pulse_width	RN ()	0.15301	0.42182	13.33370
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	RN ()	0.15147	0.41733	13.33370
	min_pulse_width	RN ()	0.15147	0.41733	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_12T_ls__dffr_1	min_pulse_width	CK ()	0.16432	0.40161	13.33370
	min_pulse_width	CK ()	0.16736	0.40161	13.33370
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	CK ()	0.15215	0.40161	13.33370
	min_pulse_width	CK ()	0.16432	0.40161	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffr_1	min_pulse_width	CK ()	0.37026	0.48469	13.33370
	min_pulse_width	CK ()	0.13998	0.40161	13.33370
sky130_osu_sc_12T_ls__dffr_l	min_pulse_width	CK ()	0.37026	0.48469	13.33370
	min_pulse_width	CK ()	0.13998	0.40161	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00567	0.00432	0.00000
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00514	0.00410	-0.00149

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00646	0.00562	0.00000
	RN	-0.00075	-0.03998	-0.56710
	RN	0.01451	0.01380	0.00689
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00590	0.00531	0.00275
	RN	-0.00075	-0.03092	-0.36961
	RN	0.01395	0.01347	0.01068

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00647	0.00563	0.00000
	RN	-0.00075	-0.03957	-0.55749
	RN	0.01451	0.01381	0.00706
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00591	0.00531	0.00274
	RN	-0.00075	-0.03084	-0.36788
	RN	0.01395	0.01348	0.01077

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00565	0.00431	0.00000
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00512	0.00409	-0.00164

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00141	-0.00153	-0.00153
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00706	0.00670	0.00720
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00276	0.00246	0.00303
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00141	-0.00153	-0.00153
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00706	0.00671	0.00720
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00276	0.00246	0.00303

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00153	0.00154	0.00153
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01032	0.01011	0.01036
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00508	0.00491	0.00525
sky130_osu_sc_12T_ls__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00153	0.00154	0.00153
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01032	0.01011	0.01036
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00508	0.00491	0.00525

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00223	0.00188	0.00311
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00674	0.00618	0.00734
sky130_osu_sc_12T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00223	0.00188	0.00311
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00674	0.00618	0.00734

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00568	0.00545	0.00671
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01105	0.01070	0.01171
sky130_osu_sc_12T_ls__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00568	0.00545	0.00671
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01105	0.01070	0.01171

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00035	-0.00083	0.00034
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00369	0.00267	0.00369
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00038	-0.00085	0.00034
sky130_osu_sc_12T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00035	-0.00083	0.00034
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00369	0.00267	0.00369
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00038	-0.00085	0.00034

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00875	0.00837	0.00962
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01756	0.01688	0.01765
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01306	0.01260	0.01352
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01705	0.01638	0.01885
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00924	0.00884	0.01005
sky130_osu_sc_12T_ls__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00875	0.00836	0.00963
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01756	0.01688	0.01765
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01306	0.01260	0.01352
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01705	0.01638	0.01885
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00924	0.00884	0.01005

SKY130_OSU_SC_12T_LS__DFFSRx

sky130_osu_sc_12T_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_12T_ls__dffsr_1	46.39800
sky130_osu_sc_12T_ls__dffsr_l	46.39800

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_12T_ls__dffsr_1	0.00259	0.00265	0.00617	0.00859	0.96595	0.95729
sky130_osu_sc_12T_ls__dffsr_l	0.00259	0.00265	0.00617	0.00859	0.61278	0.60722

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ls__dffsr_1	0.00000	0.00513	0.00667
sky130_osu_sc_12T_ls__dffsr_l	0.00000	0.00407	0.00561

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RR)	0.36523	1.35349	12.49740
	QN->Q (FR)	0.03452	0.89718	13.41160
	RN->Q (RR)	0.29571	1.29613	12.58420
	SN->Q (FR)	0.28858	1.48803	16.32410
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RR)	0.36615	1.43618	11.49160
	QN->Q (FR)	0.04333	0.98808	13.12920
	RN->Q (RR)	0.29621	1.37778	11.57680
	SN->Q (FR)	0.28937	1.57107	15.29820

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RF)	0.36994	1.40939	13.60080
	QN->Q (RF)	0.01856	0.49275	7.44826
	RN->Q (FF)	0.25678	1.51548	17.00950
sky130_osu_sc_12T_ls__dffsr_1	CK->Q (RF)	0.38367	1.53496	12.75020
	QN->Q (RF)	0.01960	0.47744	6.52095
	RN->Q (FF)	0.27065	1.64031	16.15150

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->QN (RR)	0.34038	0.91955	6.81854
	RN->QN (FR)	0.22735	1.02564	10.21830
sky130_osu_sc_12T_ls__dffsr_1	CK->QN (RR)	0.34959	1.01446	6.73594
	RN->QN (FR)	0.23647	1.12033	10.12700

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffsr_1	CK->QN (RF)	0.30952	0.64785	2.79929
	RN->QN (RF)	0.24075	0.59197	2.89392
	SN->QN (FF)	0.23352	0.78347	6.64033
sky130_osu_sc_12T_ls__dffsr_l	CK->QN (RF)	0.30166	0.63568	2.28861
	RN->QN (RF)	0.23312	0.58055	2.37980
	SN->QN (FF)	0.22576	0.77209	6.10481

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.04988	-0.08434	-0.47981
	setup	CK (R)	0.27473	0.29697	1.69334
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.05358	-0.08201	-0.47621
	setup	CK (R)	0.27414	0.29684	1.69294

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.17361	-0.44484	-5.90580
	setup	CK (R)	0.20507	0.45671	5.98440
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.17373	-0.44589	-5.90645
	setup	CK (R)	0.20461	0.45671	5.98387

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.04988	-0.08434	-0.47981
	setup	CK (R)	0.27473	0.29697	1.69334
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.05358	-0.08201	-0.47621
	setup	CK (R)	0.27414	0.29684	1.69294

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	hold	CK (R)	-0.17361	-0.44484	-5.90580
	setup	CK (R)	0.20507	0.45671	5.98440
sky130_osu_sc_12T_ls__dffsr_l	hold	CK (R)	-0.17373	-0.44589	-5.90645
	setup	CK (R)	0.20461	0.45671	5.98387

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.23325	0.25330	1.50799
	removal	CK (R)	-0.03099	-0.04150	-0.09632
	hold	SN (R)	-0.22852	-0.38775	-2.56409
	setup	SN (R)	0.24957	0.42217	6.30997
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.23352	0.25307	1.50991
	removal	CK (R)	-0.03099	-0.04150	-0.09632
	hold	SN (R)	-0.22138	-0.37758	-2.49534
	setup	SN (R)	0.24712	0.41055	6.24168

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.23325	0.25330	1.50799
	removal	CK (R)	-0.03099	-0.04150	-0.09632
	hold	SN (R)	-0.22852	-0.38775	-2.56409
	hold	SN (R)	-0.22892	-0.38971	-2.57257
	setup	SN (R)	0.24806	0.41863	6.20891
	setup	SN (R)	0.24957	0.42217	6.30997
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.23352	0.25307	1.50991
	removal	CK (R)	-0.03099	-0.04150	-0.09632
	hold	SN (R)	-0.22240	-0.37758	-2.49534
	hold	SN (R)	-0.22138	-0.37940	-2.50554
	setup	SN (R)	0.24712	0.40821	6.12854
	setup	SN (R)	0.23786	0.41055	6.24168

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	RN ()	0.17503	0.43754	13.33370
	min_pulse_width	RN ()	0.18167	0.43754	13.33370
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	RN ()	0.17417	0.43529	13.33370
	min_pulse_width	RN ()	0.17747	0.43529	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.02974	0.05966	5.36291
	removal	CK (R)	-0.00972	-0.04174	-0.36106
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.02967	0.05966	5.35201
	removal	CK (R)	-0.00816	-0.04174	-0.36106

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	recovery	CK (R)	0.02974	0.05966	5.36291
	removal	CK (R)	-0.00972	-0.04174	-0.36106
sky130_osu_sc_12T_ls__dffsr_l	recovery	CK (R)	0.02967	0.05966	5.35201
	removal	CK (R)	-0.00816	-0.04174	-0.36106

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	SN ()	0.23473	0.48693	13.33370
	min_pulse_width	SN ()	0.24324	0.48918	13.33370
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	SN ()	0.23309	0.47571	13.33370
	min_pulse_width	SN ()	0.23053	0.47795	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_12T_ls__dffsr_1	min_pulse_width	CK ()	0.16128	0.40161	13.33370
	min_pulse_width	CK ()	0.19170	0.40161	13.33370
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	CK ()	0.15215	0.40161	13.33370
	min_pulse_width	CK ()	0.18866	0.40161	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	min_pulse_width	CK ()	0.36535	0.47346	13.33370
	min_pulse_width	CK ()	0.17040	0.40161	13.33370
sky130_osu_sc_12T_ls__dffsr_l	min_pulse_width	CK ()	0.36364	0.47122	13.33370
	min_pulse_width	CK ()	0.16736	0.40161	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00697	0.00562	-0.00184
	RN	0.01278	0.01159	-0.00246
	SN	-0.00075	-0.04085	-0.58769
	SN	0.01411	0.01291	-0.00200
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00647	0.00547	-0.00024
	RN	0.01227	0.01144	0.00495
	SN	-0.00075	-0.03109	-0.37282
	SN	0.01361	0.01277	0.00573

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00738	0.00673	0.00184
	RN	-0.00075	-0.04085	-0.58769
	RN	0.01535	0.01477	0.00982
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00684	0.00628	0.00371
	RN	-0.00075	-0.03109	-0.37282
	RN	0.01480	0.01431	0.01157

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00739	0.00674	0.00186
	RN	-0.00075	-0.04063	-0.58241
	RN	0.01535	0.01477	0.00975
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00685	0.00629	0.00388
	RN	-0.00075	-0.03092	-0.36943
	RN	0.01480	0.01431	0.01164

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00695	0.00561	-0.00186
	RN	0.01276	0.01157	-0.00237
	SN	-0.00075	-0.04063	-0.58239
	SN	0.01409	0.01290	-0.00170
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00644	0.00545	-0.00037
	RN	0.01225	0.01142	0.00480
	SN	-0.00075	-0.03092	-0.36942
	SN	0.01358	0.01275	0.00564

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00149	-0.00155	-0.00155
	(!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)	0.00880	0.00847	0.00896
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00298	0.00270	0.00324
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00295	0.00268	0.00322
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00299	0.00272	0.00326
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00149	-0.00155	-0.00155
	(!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)	0.00880	0.00847	0.00896
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00298	0.00270	0.00324
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00295	0.00268	0.00322
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00299	0.00272	0.00326

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00156	0.00155	0.00155
	(!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)	0.01181	0.01159	0.01170
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00563	0.00548	0.00579
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00566	0.00550	0.00581
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00561	0.00546	0.00577
sky130_osu_sc_12T_ls__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00156	0.00155	0.00155
	(!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)	0.01181	0.01159	0.01170
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00563	0.00548	0.00579
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00566	0.00550	0.00581
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00561	0.00546	0.00577

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00181	0.00145	0.00263
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00794	0.00733	0.00839
sky130_osu_sc_12T_ls__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00181	0.00145	0.00263
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00794	0.00733	0.00839

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00629	0.00605	0.00735
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01180	0.01137	0.01240
sky130_osu_sc_12T_ls__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00629	0.00605	0.00735
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01180	0.01137	0.01240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00405	-0.00407	-0.00408
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00430	-0.00440	-0.00439
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00403	-0.00408	-0.00407
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00171	0.00137	0.00205
sky130_osu_sc_12T_ls__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00405	-0.00407	-0.00408
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00430	-0.00440	-0.00439
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00403	-0.00408	-0.00407
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00171	0.00136	0.00205

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00408	0.00417	0.00410
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00437	0.00440	0.00439
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00406	0.00409	0.00407
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00951	0.00924	0.00946
sky130_osu_sc_12T_ls__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00407	0.00417	0.00410
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00437	0.00440	0.00439
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00406	0.00409	0.00407
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00951	0.00924	0.00946

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00040	-0.00089	0.00028
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00438	0.00339	0.00439
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00434	0.00334	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)	-0.00027	-0.00077	0.00044
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00212	0.00127	0.00379
sky130_osu_sc_12T_ls__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00040	-0.00089	0.00028
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00438	0.00339	0.00439
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00434	0.00333	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)	-0.00027	-0.00077	0.00044
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00212	0.00127	0.00379

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_12T_ls__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01952	0.01886	0.01961
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00892	0.00854	0.00977
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01322	0.01278	0.01370
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01325	0.01281	0.01374
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01862	0.01784	0.02023
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00925	0.00885	0.01004
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01186	0.01118	0.01377
sky130_osu_sc_12T_ls__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01952	0.01886	0.01961
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00892	0.00854	0.00977
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01322	0.01278	0.01370
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01325	0.01281	0.01374
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01862	0.01782	0.02023
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00925	0.00885	0.01004
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01186	0.01118	0.01377

SKY130_OSU_SC_12T_LS__DFFSx

sky130_osu_sc_12T_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_12T_ls__dffs_1	38.58360
sky130_osu_sc_12T_ls__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ls__dffs_1	0.00261	0.00520	0.00843	0.92690	0.92424
sky130_osu_sc_12T_ls__dffs_l	0.00261	0.00520	0.00842	0.60898	0.60935

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dffs_1	0.00000	0.00399	0.00527
sky130_osu_sc_12T_ls__dffs_l	0.00000	0.00293	0.00421

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->Q (RR)	0.25084	1.21024	12.01510
	QN->Q (FR)	0.03673	0.91475	13.62430
	SN->Q (FR)	0.21503	1.40978	15.69010
sky130_osu_sc_12T_ls__dffs_l	CK->Q (RR)	0.25276	1.29552	11.21440
	QN->Q (FR)	0.04342	0.98413	13.06080
	SN->Q (FR)	0.21583	1.49379	14.85650

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->Q (RF)	0.35326	1.38784	13.29770
	QN->Q (RF)	0.01861	0.48495	7.27111
sky130_osu_sc_12T_ls__dffs_l	CK->Q (RF)	0.36307	1.50756	12.61780
	QN->Q (RF)	0.01966	0.47550	6.48735

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->QN (RR)	0.32318	0.90753	6.77227
sky130_osu_sc_12T_ls__dffs_l	CK->QN (RR)	0.32880	0.99232	6.71035

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dffs_1	CK->QN (RF)	0.19959	0.50719	2.49986
	SN->QN (FF)	0.16223	0.70799	6.18740
sky130_osu_sc_12T_ls__dffs_l	CK->QN (RF)	0.19376	0.50225	2.10782
	SN->QN (FF)	0.15583	0.70132	5.74923

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.03406	-0.06285	-0.38514
	setup	CK (R)	0.18665	0.21623	1.40039
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.03585	-0.06346	-0.38259
	setup	CK (R)	0.18205	0.21870	1.40767

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.15636	-0.42744	-5.80319
	setup	CK (R)	0.19140	0.44720	5.86564
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.15410	-0.42752	-5.80322
	setup	CK (R)	0.19109	0.44332	5.86492

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.03406	-0.06285	-0.38514
	setup	CK (R)	0.18665	0.21623	1.40039
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.03585	-0.06346	-0.38259
	setup	CK (R)	0.18205	0.21870	1.40767

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	hold	CK (R)	-0.15636	-0.42744	-5.80319
	setup	CK (R)	0.19140	0.44720	5.86564
sky130_osu_sc_12T_ls__dffs_l	hold	CK (R)	-0.15410	-0.42752	-5.80322
	setup	CK (R)	0.19109	0.44332	5.86492

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	recovery	CK (R)	0.03730	0.06645	4.39866
	removal	CK (R)	-0.01609	-0.04174	-0.21774
sky130_osu_sc_12T_ls__dffs_l	recovery	CK (R)	0.03526	0.06575	4.38877
	removal	CK (R)	-0.01609	-0.04174	-0.21774

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	recovery	CK (R)	0.03730	0.06645	4.39866
	removal	CK (R)	-0.01609	-0.04174	-0.21774
sky130_osu_sc_12T_ls__dffs_l	recovery	CK (R)	0.03526	0.06575	4.38877
	removal	CK (R)	-0.01609	-0.04174	-0.21774

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	min_pulse_width	SN ()	0.15923	0.47122	13.33370
	min_pulse_width	SN ()	0.16282	0.47122	13.33370
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	SN ()	0.15564	0.45999	13.33370
	min_pulse_width	SN ()	0.15564	0.45999	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_12T_ls__dffs_1	min_pulse_width	CK ()	0.09435	0.40161	13.33370
	min_pulse_width	CK ()	0.17344	0.40161	13.33370
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	CK ()	0.09130	0.40161	13.33370
	min_pulse_width	CK ()	0.17040	0.40161	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dffs_1	min_pulse_width	CK ()	0.27345	0.41508	13.33370
	min_pulse_width	CK ()	0.15823	0.40161	13.33370
sky130_osu_sc_12T_ls__dffs_l	min_pulse_width	CK ()	0.27174	0.41733	13.33370
	min_pulse_width	CK ()	0.15823	0.40161	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00567	0.00426	0.00000
	SN	-0.00075	-0.03985	-0.56393
	SN	0.01219	0.01089	-0.00263
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00513	0.00406	-0.00139
	SN	-0.00075	-0.03097	-0.37050
	SN	0.01165	0.01069	0.00499

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00644	0.00564	0.00000
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00589	0.00532	0.00279

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00644	0.00565	0.00000
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00589	0.00532	0.00280

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00565	0.00428	0.00000
	SN	-0.00075	-0.03978	-0.56229
	SN	0.01217	0.01087	-0.00163
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00511	0.00404	-0.00156
	SN	-0.00075	-0.03098	-0.37072
	SN	0.01162	0.01067	0.00483

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00152	-0.00158	-0.00157
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00698	0.00659	0.00705
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00275	0.00246	0.00302
sky130_osu_sc_12T_ls__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00152	-0.00158	-0.00157
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00698	0.00659	0.00705
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00275	0.00246	0.00302

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00159	0.00159	0.00157
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01035	0.01010	0.01032
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00518	0.00501	0.00535
sky130_osu_sc_12T_ls__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00159	0.00159	0.00157
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01035	0.01010	0.01032
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00518	0.00501	0.00535

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00302	-0.00305	-0.00304
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00195	0.00163	0.00276
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00302	-0.00305	-0.00304
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00195	0.00163	0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00305	0.00306	0.00305
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00673	0.00633	0.00762
sky130_osu_sc_12T_ls__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00305	0.00306	0.00305
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00673	0.00633	0.00762

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00083	0.00034
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00032	-0.00078	0.00041
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00195	0.00109	0.00369
sky130_osu_sc_12T_ls__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00083	0.00034
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00032	-0.00078	0.00041
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00195	0.00109	0.00369

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01753	0.01687	0.01761
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00875	0.00839	0.00963
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01700	0.01619	0.01869
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00919	0.00877	0.00999
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01122	0.01055	0.01323
sky130_osu_sc_12T_ls__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01753	0.01687	0.01761
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00875	0.00840	0.00963
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01700	0.01619	0.01869
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00919	0.00877	0.00999
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01122	0.01055	0.01323

SKY130_OSU_SC_12T_LS__DFFx

sky130_osu_sc_12T_ls_ff_1P56_-40C.ccs
Cell Library: Process , Voltage 1.56,
Temp -40.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ls__dff_1	32.23440
sky130_osu_sc_12T_ls__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ls__dff_1	0.00276	0.00835	0.85532
sky130_osu_sc_12T_ls__dff_l	0.00276	0.00834	0.57873

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__dff_1	0.00000	0.00469	0.00527
sky130_osu_sc_12T_ls__dff_l	0.00000	0.00363	0.00421

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dff_1	**CK->Q (RR)**	0.20033	0.78935	6.57040
sky130_osu_sc_12T_ls__dff_l	**CK->Q (RR)**	0.20281	0.86843	6.48390

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__dff_1	**CK->Q (RF)**	0.30939	0.60277	2.50300
sky130_osu_sc_12T_ls__dff_l	**CK->Q (RF)**	0.31612	0.61896	2.22142

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	hold	CK (R)	-0.03393	-0.06320	-0.41486
	setup	CK (R)	0.12959	0.17311	1.35331
sky130_osu_sc_12T_ls__dff_l	hold	CK (R)	-0.03375	-0.06320	-0.41450
	setup	CK (R)	0.13098	0.17276	1.35190

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	hold	CK (R)	-0.14334	-0.42847	-5.86362
	setup	CK (R)	0.17525	0.44332	5.91596
sky130_osu_sc_12T_ls__dff_l	hold	CK (R)	-0.14481	-0.42852	-5.86401
	setup	CK (R)	0.17525	0.44332	5.91469

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	min_pulse_width	CK ()	0.07609	0.40161	13.33370
	min_pulse_width	CK ()	0.16128	0.40161	13.33370
sky130_osu_sc_12T_ls__dff_l	min_pulse_width	CK ()	0.07305	0.40161	13.33370
	min_pulse_width	CK ()	0.15823	0.40161	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ls__dff_1	**min_pulse_width**	**CK ()**	0.21908	0.40161	13.33370
	min_pulse_width	**CK ()**	0.13694	0.40161	13.33370
sky130_osu_sc_12T_ls__dff_l	**min_pulse_width**	**CK ()**	0.21908	0.40161	13.33370
	min_pulse_width	**CK ()**	0.13694	0.40161	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01190	0.01065	0.01325
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01079	0.00960	0.01220

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01308	0.01225	0.01314
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01198	0.01116	0.01207

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00140	-0.00152	-0.00152
	!CK	0.00000	0.00000	0.00000
	!CK	0.00616	0.00582	0.00633
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00140	-0.00152	-0.00152
	!CK	0.00000	0.00000	0.00000
	!CK	0.00616	0.00582	0.00633

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00152	0.00154	0.00152
	!CK	0.00000	0.00000	0.00000
	!CK	0.01068	0.01042	0.01063
sky130_osu_sc_12T_ls__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00152	0.00154	0.00152
	!CK	0.00000	0.00000	0.00000
	!CK	0.01068	0.01042	0.01063

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00038	-0.00086	0.00032
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00032	-0.00078	0.00042
sky130_osu_sc_12T_ls__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00038	-0.00086	0.00032
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00032	-0.00078	0.00042

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00873	0.00835	0.00961
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01671	0.01604	0.01689
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01721	0.01637	0.01893
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00913	0.00871	0.00994
sky130_osu_sc_12T_ls__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00873	0.00835	0.00961
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01671	0.01604	0.01689
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01721	0.01636	0.01893
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00913	0.00871	0.00994

SKY130_OSU_SC_12T_LS__INVx

sky130_osu_sc_12T_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_12T_ls__inv_1	4.39560
sky130_osu_sc_12T_ls__inv_10	21.97800
sky130_osu_sc_12T_ls__inv_2	6.34920
sky130_osu_sc_12T_ls__inv_3	8.30280
sky130_osu_sc_12T_ls__inv_4	10.25640
sky130_osu_sc_12T_ls__inv_6	14.16360
sky130_osu_sc_12T_ls__inv_8	18.07080
sky130_osu_sc_12T_ls__inv_l	4.38570

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ls__inv_1	0.00268	0.84742
sky130_osu_sc_12T_ls__inv_10	0.02380	8.52422
sky130_osu_sc_12T_ls__inv_2	0.00496	1.76891
sky130_osu_sc_12T_ls__inv_3	0.00733	2.56329
sky130_osu_sc_12T_ls__inv_4	0.00964	3.50676
sky130_osu_sc_12T_ls__inv_6	0.01443	5.22664
sky130_osu_sc_12T_ls__inv_8	0.01911	6.89066
sky130_osu_sc_12T_ls__inv_l	0.00216	0.55908

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__inv_1	0.00000	0.00065	0.00120
sky130_osu_sc_12T_ls__inv_10	0.00000	0.00646	0.01204
sky130_osu_sc_12T_ls__inv_2	0.00000	0.00129	0.00241
sky130_osu_sc_12T_ls__inv_3	0.00000	0.00194	0.00361
sky130_osu_sc_12T_ls__inv_4	0.00000	0.00258	0.00482
sky130_osu_sc_12T_ls__inv_6	0.00000	0.00388	0.00722
sky130_osu_sc_12T_ls__inv_8	0.00000	0.00517	0.00963
sky130_osu_sc_12T_ls__inv_l	0.00000	0.00012	0.00016

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__inv_1	**A->Y (FR)**	0.03557	0.85974	12.45920
sky130_osu_sc_12T_ls__inv_10	**A->Y (FR)**	0.03935	0.56411	12.45070
sky130_osu_sc_12T_ls__inv_2	**A->Y (FR)**	0.02573	0.72622	12.44860
sky130_osu_sc_12T_ls__inv_3	**A->Y (FR)**	0.02733	0.67143	12.40090
sky130_osu_sc_12T_ls__inv_4	**A->Y (FR)**	0.02670	0.63911	12.45620
sky130_osu_sc_12T_ls__inv_6	**A->Y (FR)**	0.02954	0.59743	12.46270
sky130_osu_sc_12T_ls__inv_8	**A->Y (FR)**	0.03400	0.57607	12.42600
sky130_osu_sc_12T_ls__inv_l	**A->Y (FR)**	0.04368	0.93415	12.19290

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__inv_1	**A->Y (RF)**	0.01685	0.41816	6.09249
sky130_osu_sc_12T_ls__inv_10	**A->Y (RF)**	0.02251	0.26991	6.37241
sky130_osu_sc_12T_ls__inv_2	**A->Y (RF)**	0.01358	0.36517	6.27289
sky130_osu_sc_12T_ls__inv_3	**A->Y (RF)**	0.01466	0.34071	6.32272
sky130_osu_sc_12T_ls__inv_4	**A->Y (RF)**	0.01453	0.32048	6.38022
sky130_osu_sc_12T_ls__inv_6	**A->Y (RF)**	0.01712	0.29642	6.41085
sky130_osu_sc_12T_ls__inv_8	**A->Y (RF)**	0.01975	0.28054	6.39854
sky130_osu_sc_12T_ls__inv_l	**A->Y (RF)**	0.01851	0.42349	5.54863

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__inv_1	A	0.00000	0.00000	0.00000
	A	0.00275	0.00269	0.00280
sky130_osu_sc_12T_ls__inv_10	A	0.00000	0.00000	0.00000
	A	0.02226	0.02265	0.02427
sky130_osu_sc_12T_ls__inv_2	A	0.00000	0.00000	0.00000
	A	0.00472	0.00470	0.00496
sky130_osu_sc_12T_ls__inv_3	A	0.00000	0.00000	0.00000
	A	0.00726	0.00717	0.00764
sky130_osu_sc_12T_ls__inv_4	A	0.00000	0.00000	0.00000
	A	0.00923	0.00921	0.00980
sky130_osu_sc_12T_ls__inv_6	A	0.00000	0.00000	0.00000
	A	0.01364	0.01285	0.01466
sky130_osu_sc_12T_ls__inv_8	A	0.00000	0.00000	0.00000
	A	0.01799	0.01817	0.01950
sky130_osu_sc_12T_ls__inv_l	A	0.00000	0.00000	0.00000
	A	0.00221	0.00215	0.00231

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00044	-0.00039
sky130_osu_sc_12T_ls__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00754	-0.00742	-0.00584
sky130_osu_sc_12T_ls__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00138	-0.00139	-0.00125
sky130_osu_sc_12T_ls__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00179	-0.00184	-0.00155
sky130_osu_sc_12T_ls__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00285	-0.00286	-0.00241
sky130_osu_sc_12T_ls__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00434	-0.00435	-0.00355
sky130_osu_sc_12T_ls__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00592	-0.00583	-0.00471
sky130_osu_sc_12T_ls__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00034	-0.00027

SKY130_OSU_SC_12T_LS__MUX2

sky130_osu_sc_12T_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_12T_ls__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ls__mux2_1	0.05373	0.05362	0.00553	0.04965

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__mux2_1	0.00000	0.00194	0.00361

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__mux2_1	A0->Y (RR)	-	0.01216	0.20593	1.07671
	A1->Y (RR)	-	0.01499	0.21032	1.08028
	S0->Y (RR)	(!A0 * A1)	0.04065	0.18751	-0.34328
	S0->Y (FR)	(A0 * !A1)	0.03799	0.40501	3.30351

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__mux2_1	A0->Y (FF)	-	0.01427	0.17740	1.40036
	A1->Y (FF)	-	0.01280	0.17466	1.39176
	S0->Y (FF)	(!A0 * A1)	0.07341	0.39013	2.88695
	S0->Y (RF)	(A0 * !A1)	0.01887	0.15822	0.33212

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00281	-0.00281	-0.00282
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00178	-0.00178	-0.00179
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00373	0.00347	0.00504
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00167	-0.00206	-0.00061

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00281	0.00281	0.00283
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00178	0.00178	0.00179
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00052	0.00014	0.00167
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00750	0.00721	0.00863

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00068	-0.00068	-0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00068	0.00068	0.00068

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00082	-0.00082	-0.00082

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00082	0.00082	0.00082

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00059	-0.00099	0.00052
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00057	-0.00097	0.00051

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00579	0.00551	0.00694
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00544	0.00520	0.00673

SKY130_OSU_SC_12T_LS__NAND2x

sky130_osu_sc_12T_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_12T_ls__nand2_1	6.34920
sky130_osu_sc_12T_ls__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__nand2_1	0.00267	0.00266	0.84177
sky130_osu_sc_12T_ls__nand2_l	0.00211	0.00214	0.55709

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__nand2_1	0.00000	0.00066	0.00241
sky130_osu_sc_12T_ls__nand2_l	0.00000	0.00014	0.00032

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nand2_1	A->Y (FR)	0.03745	0.86244	12.45450
	B->Y (FR)	0.04313	0.83084	11.94350
sky130_osu_sc_12T_ls__nand2_l	A->Y (FR)	0.04457	0.93577	12.19460
	B->Y (FR)	0.05397	0.94341	12.17910

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nand2_1	A->Y (RF)	0.02330	0.50022	7.21044
	B->Y (RF)	0.02697	0.50489	7.16784
sky130_osu_sc_12T_ls__nand2_l	A->Y (RF)	0.02576	0.51525	6.69442
	B->Y (RF)	0.02915	0.51318	6.54655

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00292	0.00285	0.00294
	B	0.00000	0.00000	0.00000
	B	0.00375	0.00365	0.00379
sky130_osu_sc_12T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00224	0.00218	0.00232
	B	0.00000	0.00000	0.00000
	B	0.00285	0.00278	0.00293

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00020	-0.00026	-0.00021
	B	0.00000	0.00000	0.00000
	B	-0.00019	-0.00026	-0.00023
sky130_osu_sc_12T_ls__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00014	-0.00018	-0.00012
	B	0.00000	0.00000	0.00000
	B	-0.00014	-0.00018	-0.00015

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00183	-0.00185	-0.00184
sky130_osu_sc_12T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00131	-0.00133	-0.00133

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ls__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00132	0.00134	0.00133

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00167	-0.00168	-0.00168
sky130_osu_sc_12T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00122	-0.00123	-0.00122

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00169	0.00169	0.00168
sky130_osu_sc_12T_ls__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00124	0.00123	0.00122

SKY130_OSU_SC_12T_LS__NOR2x

sky130_osu_sc_12T_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_12T_ls__nor2_1	6.34920
sky130_osu_sc_12T_ls__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__nor2_1	0.00262	0.00290	0.44901
sky130_osu_sc_12T_ls__nor2_l	0.00202	0.00224	0.29537

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__nor2_1	0.00000	0.00067	0.00120
sky130_osu_sc_12T_ls__nor2_l	0.00000	0.00014	0.00016

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nor2_1	A->Y (FR)	0.08125	1.05687	12.43180
	B->Y (FR)	0.06634	1.03276	12.40500
sky130_osu_sc_12T_ls__nor2_l	A->Y (FR)	0.09486	1.16396	12.20070
	B->Y (FR)	0.08228	1.13558	12.12520

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__nor2_1	A->Y (RF)	0.02099	0.34759	4.16617
	B->Y (RF)	0.01781	0.33894	4.15281
sky130_osu_sc_12T_ls__nor2_l	A->Y (RF)	0.02169	0.34845	3.71680
	B->Y (RF)	0.01929	0.34031	3.70491

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00377	0.00370	0.00371
	B	0.00000	0.00000	0.00000
	B	0.00304	0.00293	0.00306
sky130_osu_sc_12T_ls__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00279	0.00273	0.00275
	B	0.00000	0.00000	0.00000
	B	0.00233	0.00224	0.00243

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00034	0.00020	0.00026
	B	0.00000	0.00000	0.00000
	B	-0.00032	-0.00032	-0.00030
sky130_osu_sc_12T_ls__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00024	0.00015	0.00025
	B	0.00000	0.00000	0.00000
	B	-0.00021	-0.00021	-0.00015

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00140	-0.00154	-0.00154
sky130_osu_sc_12T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00097	-0.00107	-0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00153	0.00154	0.00154
sky130_osu_sc_12T_ls__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00106	0.00107	0.00106

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00076	-0.00077	-0.00077
sky130_osu_sc_12T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00055	-0.00055	-0.00055

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00081	0.00081	0.00078
sky130_osu_sc_12T_ls__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00058	0.00058	0.00056

SKY130_OSU_SC_12T_LS__OAI21

sky130_osu_sc_12T_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_12T_ls__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ls__oai21_l	0.00266	0.00274	0.00239	0.45550

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__oai21_l	0.00000	0.00043	0.00136

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai21_l	A0->Y (FR)	0.09508	1.06987	12.56520
	A1->Y (FR)	0.11405	1.09880	12.59710
	B0->Y (FR)	0.05531	0.87450	10.93280

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai21_l	A0->Y (RF)	0.03236	0.42353	5.04985
	A1->Y (RF)	0.03630	0.42377	5.00553
	B0->Y (RF)	0.02531	0.43034	5.30401

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00422	0.00409	0.00419
	A1	0.00000	0.00000	0.00000
	A1	0.00500	0.00489	0.00488
	B0	0.00334	0.00322	0.00333

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00023	0.00019	0.00019
	A1	0.00000	0.00000	0.00000
	A1	0.00093	0.00079	0.00080
	B0	0.00120	0.00115	0.00118

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00077	-0.00077	-0.00077
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00152	-0.00157	-0.00157
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00160	-0.00161	-0.00160

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00081	0.00082	0.00078
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00157	0.00157	0.00157
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00161	0.00161	0.00161

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00135	-0.00148	-0.00148
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00149	-0.00155	-0.00155
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00158	-0.00159	-0.00158

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00147	0.00148	0.00148
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00154	0.00155	0.00155
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00158	0.00160	0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00139	-0.00140	-0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00142	0.00145	0.00143

SKY130_OSU_SC_12T_LS__OAI22

sky130_osu_sc_12T_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_12T_ls__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ls__oai22_1	0.00248	0.00262	0.00280	0.00276	0.47775

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__oai22_1	0.00000	0.00102	0.00241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai22_l	A0->Y (FR)	0.12172	1.09624	12.62720
	A1->Y (FR)	0.10690	1.07079	12.60810
	B0->Y (FR)	0.07001	1.03311	12.57770
	B1->Y (FR)	0.08608	1.05947	12.59500

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__oai22_l	A0->Y (RF)	0.04774	0.45180	5.23050
	A1->Y (RF)	0.04022	0.44128	5.20676
	B0->Y (RF)	0.03343	0.44936	5.47075
	B1->Y (RF)	0.04137	0.46439	5.53308

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	A0	0.00631	0.00622	0.00621
	A1	0.00554	0.00541	0.00550
	B0	0.00400	0.00387	0.00395
	B1	0.00483	0.00471	0.00468

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	A0	0.00133	0.00121	0.00120
	A1	0.00071	0.00066	0.00064
	B0	0.00070	0.00067	0.00067
	B1	0.00134	0.00120	0.00123

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00138	-0.00151	-0.00150
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00138	-0.00151	-0.00150
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00145	-0.00151	-0.00150
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00153	-0.00154	-0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00149	0.00151	0.00150
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00149	0.00151	0.00150
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00149	0.00151	0.00150
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00153	0.00154	0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00075	-0.00075	-0.00075
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00074	-0.00075	-0.00075
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00145	-0.00148	-0.00149
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00152	-0.00153	-0.00152

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00079	0.00079	0.00076
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00079	0.00079	0.00076
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00148	0.00148	0.00149
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00152	0.00154	0.00153

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00075	-0.00076	-0.00076
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00075	-0.00076	-0.00076
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00175	-0.00181	-0.00180
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00178	-0.00179	-0.00182

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00080	0.00080	0.00077
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00080	0.00080	0.00077
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00181	0.00182	0.00180
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00182	0.00185	0.00183

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00137	-0.00149	-0.00149
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00137	-0.00149	-0.00149
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00178	-0.00184	-0.00184
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00182	-0.00184	-0.00186

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00148	0.00150	0.00149
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00148	0.00151	0.00149
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00185	0.00186	0.00184
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00186	0.00188	0.00187

SKY130_OSU_SC_12T_LS__OR2x

sky130_osu_sc_12T_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_12T_ls__or2_1	8.30280
sky130_osu_sc_12T_ls__or2_2	10.25640
sky130_osu_sc_12T_ls__or2_4	14.16360
sky130_osu_sc_12T_ls__or2_8	21.97800
sky130_osu_sc_12T_ls__or2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__or2_1	0.00297	0.00274	0.87132
sky130_osu_sc_12T_ls__or2_2	0.00297	0.00274	1.80855
sky130_osu_sc_12T_ls__or2_4	0.00297	0.00274	3.54049
sky130_osu_sc_12T_ls__or2_8	0.00296	0.00275	6.87348
sky130_osu_sc_12T_ls__or2_l	0.00228	0.00214	0.57807

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__or2_1	0.00000	0.00104	0.00138
sky130_osu_sc_12T_ls__or2_2	0.00000	0.00140	0.00258
sky130_osu_sc_12T_ls__or2_4	0.00000	0.00214	0.00499
sky130_osu_sc_12T_ls__or2_8	0.00000	0.00360	0.00981
sky130_osu_sc_12T_ls__or2_l	0.00000	0.00023	0.00031

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__or2_1	A->Y (RR)	0.06627	0.66024	6.53424
	B->Y (RR)	0.06117	0.64380	6.45166
sky130_osu_sc_12T_ls__or2_2	A->Y (RR)	0.06838	0.55841	6.67203
	B->Y (RR)	0.06268	0.54285	6.59411
sky130_osu_sc_12T_ls__or2_4	A->Y (RR)	0.08847	0.52378	6.91979
	B->Y (RR)	0.08267	0.51205	6.86073
sky130_osu_sc_12T_ls__or2_8	A->Y (RR)	0.12885	0.54234	7.31464
	B->Y (RR)	0.12303	0.53489	7.26841
sky130_osu_sc_12T_ls__or2_l	A->Y (RR)	0.07356	0.73575	6.22932
	B->Y (RR)	0.06917	0.71954	6.16433

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__or2_1	A->Y (FF)	0.13968	0.65000	5.95929
	B->Y (FF)	0.11672	0.61922	5.69231
sky130_osu_sc_12T_ls__or2_2	A->Y (FF)	0.17122	0.66644	6.38295
	B->Y (FF)	0.14863	0.63954	6.12355
sky130_osu_sc_12T_ls__or2_4	A->Y (FF)	0.24581	0.73884	6.87004
	B->Y (FF)	0.22325	0.70994	6.64719
sky130_osu_sc_12T_ls__or2_8	A->Y (FF)	0.39469	0.90515	7.46786
	B->Y (FF)	0.37210	0.87574	7.30483
sky130_osu_sc_12T_ls__or2_l	A->Y (FF)	0.15738	0.67567	5.63115
	B->Y (FF)	0.13470	0.64305	5.36626

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00289	0.00244	0.00338
	B	0.00000	0.00000	0.00000
	B	0.00226	0.00204	0.00325
sky130_osu_sc_12T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.00484	0.00456	0.00530
	B	0.00000	0.00000	0.00000
	B	0.00417	0.00414	0.00544
sky130_osu_sc_12T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.00920	0.00928	0.01011
	B	0.00000	0.00000	0.00000
	B	0.00851	0.00893	0.01035
sky130_osu_sc_12T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.01784	0.01859	0.02000
	B	0.00000	0.00000	0.00000
	B	0.01715	0.01824	0.02042
sky130_osu_sc_12T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00225	0.00198	0.00294
	B	0.00000	0.00000	0.00000
	B	0.00180	0.00165	0.00301

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	A	0.00000	0.00000	0.00000
	A	0.00661	0.00631	0.00662
	B	0.00000	0.00000	0.00000
	B	0.00562	0.00551	0.00676
sky130_osu_sc_12T_ls__or2_2	A	0.00000	0.00000	0.00000
	A	0.00817	0.00815	0.00840
	B	0.00000	0.00000	0.00000
	B	0.00717	0.00729	0.00841
sky130_osu_sc_12T_ls__or2_4	A	0.00000	0.00000	0.00000
	A	0.01205	0.01243	0.01269
	B	0.00000	0.00000	0.00000
	B	0.01094	0.01147	0.01258
sky130_osu_sc_12T_ls__or2_8	A	0.00000	0.00000	0.00000
	A	0.01981	0.02074	0.02145
	B	0.00000	0.00000	0.00000
	B	0.01904	0.01980	0.02122
sky130_osu_sc_12T_ls__or2_l	A	0.00000	0.00000	0.00000
	A	0.00501	0.00483	0.00523
	B	0.00000	0.00000	0.00000
	B	0.00432	0.00426	0.00571

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00143	-0.00157	-0.00155
sky130_osu_sc_12T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00143	-0.00157	-0.00155
sky130_osu_sc_12T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00143	-0.00157	-0.00155
sky130_osu_sc_12T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00143	-0.00157	-0.00155
sky130_osu_sc_12T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00098	-0.00107	-0.00107

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00154	0.00157	0.00155
sky130_osu_sc_12T_ls__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00154	0.00157	0.00155
sky130_osu_sc_12T_ls__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00154	0.00157	0.00155
sky130_osu_sc_12T_ls__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00154	0.00157	0.00155
sky130_osu_sc_12T_ls__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00107	0.00107	0.00107

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00077	-0.00077	-0.00077
sky130_osu_sc_12T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00077	-0.00077	-0.00077
sky130_osu_sc_12T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00077	-0.00077	-0.00077
sky130_osu_sc_12T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00077	-0.00077	-0.00077
sky130_osu_sc_12T_ls__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00054	-0.00054	-0.00054

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00078
sky130_osu_sc_12T_ls__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00078
sky130_osu_sc_12T_ls__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00078
sky130_osu_sc_12T_ls__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00078
sky130_osu_sc_12T_ls__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00057	0.00057	0.00055

SKY130_OSU_SC_12T_LS__TBUFIx

sky130_osu_sc_12T_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_12T_ls__tbufi_1	8.30280
sky130_osu_sc_12T_ls__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ls__tbufi_1	0.00287	0.00382	0.46362
sky130_osu_sc_12T_ls__tbufi_l	0.00225	0.00299	0.29532

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__tbufi_1	0.00000	0.00070	0.00241
sky130_osu_sc_12T_ls__tbufi_l	0.00000	0.00016	0.00032

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tbufi_1	A->Y (FR)	0.06071	1.01400	12.35130
	OE->Y (FR)	0.05332	0.32624	4.59466
	OE->Y (RR)	0.08792	0.79835	6.40509
sky130_osu_sc_12T_ls__tbufi_l	A->Y (FR)	0.07893	1.13273	12.12700
	OE->Y (FR)	0.05893	0.33249	4.59463
	OE->Y (RR)	0.10268	0.91443	6.17490

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tbufi_1	A->Y (RF)	0.02250	0.40736	5.03113
	OE->Y (FF)	0.05409	0.32765	4.59463
	OE->Y (RF)	0.02256	0.40917	5.03970
sky130_osu_sc_12T_ls__tbufi_l	A->Y (RF)	0.02520	0.41176	4.49464
	OE->Y (FF)	0.05941	0.33210	4.59468
	OE->Y (RF)	0.02476	0.40664	4.43636

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00281	0.00269	0.00280
	OE	0.00000	0.00000	0.00000
	OE	0.00270	0.00240	0.00387
sky130_osu_sc_12T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00217	0.00206	0.00223
	OE	0.00000	0.00000	0.00000
	OE	0.00200	0.00174	0.00346

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00033	-0.00033	-0.00031
	OE	0.00000	0.00000	0.00000
	OE	0.00175	0.00139	0.00301
sky130_osu_sc_12T_ls__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00021	-0.00021	-0.00015
	OE	0.00000	0.00000	0.00000
	OE	0.00124	0.00099	0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00132	-0.00134	-0.00133
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00122	-0.00123	-0.00122
sky130_osu_sc_12T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00097	-0.00098	-0.00098
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00090	-0.00091	-0.00090

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00132	0.00134	0.00133
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00125	0.00126	0.00124
sky130_osu_sc_12T_ls__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00097	0.00098	0.00098
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00093	0.00093	0.00091

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00100	0.00065	0.00227
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00089	0.00053	0.00215
sky130_osu_sc_12T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00072	0.00047	0.00224
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00062	0.00036	0.00215

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00333	0.00303	0.00454
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00346	0.00314	0.00462
sky130_osu_sc_12T_ls__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00255	0.00236	0.00411
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00266	0.00244	0.00418

SKY130_OSU_SC_12T_LS__TNBUFIx

sky130_osu_sc_12T_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_12T_ls__tnbufi_1	8.30280
sky130_osu_sc_12T_ls__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ls__tnbufi_1	0.00287	0.00416	0.47181
sky130_osu_sc_12T_ls__tnbufi_l	0.00215	0.00322	0.30314

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__tnbufi_1	0.00000	0.00107	0.00129
sky130_osu_sc_12T_ls__tnbufi_l	0.00000	0.00019	0.00023

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tnbufi_1	A->Y (FR)	0.06114	1.02079	12.47900
	OE->Y (RR)	0.02145	0.27916	4.59481
	OE->Y (FR)	0.07220	1.04215	12.49600
sky130_osu_sc_12T_ls__tnbufi_l	A->Y (FR)	0.07736	1.14340	12.31140
	OE->Y (RR)	0.02316	0.27893	4.59458
	OE->Y (FR)	0.08620	1.16956	12.39090

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ls__tnbufi_1	A->Y (RF)	0.02195	0.40931	5.08594
	OE->Y (RF)	0.02118	0.27914	4.59488
	OE->Y (FF)	0.05756	0.50971	4.67831
sky130_osu_sc_12T_ls__tnbufi_l	A->Y (RF)	0.02384	0.41415	4.57120
	OE->Y (RF)	0.02292	0.27893	4.59458
	OE->Y (FF)	0.06615	0.52736	4.42643

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00292	0.00280	0.00290
	OE	0.00000	0.00000	0.00000
	OE	0.00692	0.00678	0.00855
sky130_osu_sc_12T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00223	0.00213	0.00229
	OE	0.00000	0.00000	0.00000
	OE	0.00536	0.00524	0.00722

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00047	-0.00047	-0.00044
	OE	0.00000	0.00000	0.00000
	OE	0.00609	0.00594	0.00751
sky130_osu_sc_12T_ls__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00036	-0.00035	-0.00030
	OE	0.00000	0.00000	0.00000
	OE	0.00471	0.00459	0.00637

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00108	-0.00109	-0.00108
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00098	-0.00099	-0.00098
sky130_osu_sc_12T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00075	-0.00077	-0.00076
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00068	-0.00070	-0.00069

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00108	0.00109	0.00108
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00101	0.00102	0.00100
sky130_osu_sc_12T_ls__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00075	0.00077	0.00076
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00071	0.00071	0.00070

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00173	-0.00222	-0.00054
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00164	-0.00217	-0.00051
sky130_osu_sc_12T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00119	-0.00157	0.00024
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00115	-0.00154	0.00025

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ls__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00522	0.00508	0.00681
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00513	0.00500	0.00673
sky130_osu_sc_12T_ls__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00410	0.00398	0.00590
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00404	0.00393	0.00585

SKY130_OSU_SC_12T_LS__XNOR2

sky130_osu_sc_12T_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_12T_ls__xnor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__xnor2_l	0.00574	0.00485	0.48420

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__xnor2_l	0.00000	0.00204	0.00370

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xnor2_l	A->Y (RR)	B	0.11421	0.84439	6.73283
	A->Y (FR)	!B	0.08268	1.04326	12.56210
	B->Y (RR)	A	0.09397	0.82301	6.68920
	B->Y (FR)	!A	0.09986	1.06685	12.56410

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xnor2_l	A->Y (FF)	B	0.08883	0.57018	4.97384
	A->Y (RF)	!B	0.03135	0.42340	5.17870
	B->Y (FF)	A	0.08215	0.56287	4.97026
	B->Y (RF)	!A	0.03522	0.42984	5.18471

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00291	0.00245	0.00421
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00714	0.00674	0.00830
	B	A	0.00000	0.00000	0.00000
	B	A	0.00146	0.00119	0.00273
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00743	0.00713	0.00872

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00838	0.00792	0.00927
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00203	0.00162	0.00315
	B	A	0.00000	0.00000	0.00000
	B	A	0.00770	0.00754	0.00903
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00250	0.00204	0.00358

SKY130_OSU_SC_12T_LS__XOR2

sky130_osu_sc_12T_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_12T_ls__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ls__xor2_l	0.00576	0.00489	0.44733

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__xor2_l	0.00000	0.00204	0.00260

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xor2_l	A->Y (RR)	!B	0.12536	0.84973	6.57023
	A->Y (FR)	B	0.10201	1.07316	12.42960
	B->Y (RR)	!A	0.10044	0.83705	6.56513
	B->Y (FR)	A	0.11227	1.08494	12.43460

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ls__xor2_l	A->Y (FF)	!B	0.09303	0.57131	4.85599
	A->Y (RF)	B	0.02963	0.41715	4.93628
	B->Y (FF)	!A	0.08580	0.55913	4.80695
	B->Y (RF)	A	0.03469	0.42009	4.94895

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00827	0.00793	0.00948
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00195	0.00111	0.00247
	B	A	0.00000	0.00000	0.00000
	B	A	0.00835	0.00805	0.00964
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00138	0.00108	0.00259

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ls__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00156	0.00102	0.00253
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00895	0.00871	0.01007
	B	A	0.00000	0.00000	0.00000
	B	A	0.00158	0.00109	0.00259
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00779	0.00768	0.00915

SKY130_OSU_SC_12T_LS_x

sky130_osu_sc_12T_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_12T_ls__ant	4.39560
sky130_osu_sc_12T_ls__tiehi	4.39560
sky130_osu_sc_12T_ls__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ls__ant	0.18985
sky130_osu_sc_12T_ls__tiehi	0.00000
sky130_osu_sc_12T_ls__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ls__ant	0.00000	90386.30000	180773.00000
sky130_osu_sc_12T_ls__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ls__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__ant	0.00000	0.00000	0.00000
	-0.00138	0.01415	0.23702

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ls__ant	0.00000	0.00000	0.00000
	1.57401	1.49992	0.30733