sky130_osu_sc_12T_ms_tt_1P50_25C.ccs Library

Cell Groups
SKY130_OSU_SC_12T_MS__ADDFx
SKY130_OSU_SC_12T_MS__ADDHx
SKY130_OSU_SC_12T_MS__AND2x
SKY130_OSU_SC_12T_MS__AOI21
SKY130_OSU_SC_12T_MS__AOI22
SKY130_OSU_SC_12T_MS__BUFx
SKY130_OSU_SC_12T_MS__DFFNRx
SKY130_OSU_SC_12T_MS__DFFRx
SKY130_OSU_SC_12T_MS__DFFSRx
SKY130_OSU_SC_12T_MS__DFFSx
SKY130_OSU_SC_12T_MS__DFFx
SKY130_OSU_SC_12T_MS__INVx
SKY130_OSU_SC_12T_MS__MUX2
SKY130_OSU_SC_12T_MS__NAND2x
SKY130_OSU_SC_12T_MS__NOR2x
SKY130_OSU_SC_12T_MS__OAI21
SKY130_OSU_SC_12T_MS__OAI22
SKY130_OSU_SC_12T_MS__OR2x
SKY130_OSU_SC_12T_MS__TBUFIx
SKY130_OSU_SC_12T_MS__TNBUFIx
SKY130_OSU_SC_12T_MS__XNOR2
SKY130_OSU_SC_12T_MS__XOR2
SKY130_OSU_SC_12T_MS_x

SKY130_OSU_SC_12T_MS__ADDFx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__addf_1	31.25760
sky130_osu_sc_12T_ms__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_ms__addf_1	0.01066	0.01073	0.00824	0.92899	0.40318	0.83447
sky130_osu_sc_12T_ms__addf_l	0.01066	0.01073	0.00824	0.65337	0.40411	0.83447

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.02671	0.03324
sky130_osu_sc_12T_ms__addf_l	0.00000	0.09679	0.17349

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.19177	1.93960	25.05510
	B->CO (RR)	0.18546	1.88784	24.46940
	CI->CO (RR)	0.18075	1.95299	25.46230
	CON->CO (FR)	0.03360	0.84171	11.88510
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.18733	1.77759	20.38110
	B->CO (RR)	0.18163	1.74033	20.11820
	CI->CO (RR)	0.17637	1.79158	20.81010
	CON->CO (FR)	0.03838	0.88148	11.38450

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.31453	2.74025	34.69450
	B->CO (FF)	0.28352	2.62830	33.47810
	CI->CO (FF)	0.27995	2.69773	34.72410
	CON->CO (RF)	0.02512	0.61929	8.79323
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.30676	2.44810	27.31540
	B->CO (FF)	0.27684	2.35407	26.44520
	CI->CO (FF)	0.27208	2.40651	27.36390
	CON->CO (RF)	0.02800	0.64922	8.55871

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (FR)	0.23228	1.20813	11.58400
	B->CON (FR)	0.20210	1.14209	11.25230
	CI->CON (FR)	0.19767	1.16734	11.66210
sky130_osu_sc_12T_ms__addf_1	A->CON (FR)	0.22154	1.19827	11.58950
	B->CON (FR)	0.19199	1.13277	11.25750
	CI->CON (FR)	0.18695	1.15741	11.66800

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->CON (RF)	0.11245	0.67995	7.03398
	B->CON (RF)	0.10831	0.68096	7.27180
	CI->CON (RF)	0.10136	0.69546	7.51956
sky130_osu_sc_12T_ms__addf_1	A->CON (RF)	0.10891	0.67695	7.03862
	B->CON (RF)	0.10493	0.67806	7.27624
	CI->CON (RF)	0.09780	0.69233	7.52421

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-R)	0.44796	2.57208	26.86120
	B->S (-R)	0.45138	2.54653	26.30260
	CI->S (-R)	0.41064	2.52388	26.88030
	CON->S (RR)	0.10773	0.82618	7.86494
sky130_osu_sc_12T_ms__addf_1	A->S (-R)	0.43167	2.55975	26.85010
	B->S (-R)	0.43528	2.53425	26.29170
	CI->S (-R)	0.39428	2.51134	26.87050
	CON->S (RR)	0.10777	0.82653	7.86457

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addf_1	A->S (-F)	0.33702	1.71993	16.74670
	B->S (-F)	0.33011	1.64813	16.44800
	CI->S (-F)	0.32514	1.72956	17.15470
	CON->S (FF)	0.14481	0.76192	6.21051
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.32917	1.71357	16.74240
	B->S (-F)	0.32287	1.64276	16.44400
	CI->S (-F)	0.31746	1.72372	17.15010
	CON->S (FF)	0.14482	0.76188	6.21041

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00204	0.00195	0.00263
	B	0.00240	0.00241	0.00312
	CI	0.00241	0.00251	0.00339
sky130_osu_sc_12T_ms__addf_l	A	0.00185	0.00174	0.00222
	B	0.00221	0.00220	0.00275
	CI	0.00223	0.00231	0.00294

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00593	0.00601	0.00807
	B	0.00623	0.00637	0.00798
	CI	0.00549	0.00568	0.00735
sky130_osu_sc_12T_ms__addf_l	A	0.00620	0.00619	0.00716
	B	0.00607	0.00618	0.00718
	CI	0.00533	0.00550	0.00658

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00633	0.00634	0.00679
	B	0.00622	0.00631	0.00680
	CI	0.00548	0.00561	0.00622
sky130_osu_sc_12T_ms__addf_l	A	0.00618	0.00618	0.00662
	B	0.00607	0.00615	0.00663
	CI	0.00532	0.00546	0.00604

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00202	0.00191	0.00218
	B	0.00238	0.00235	0.00263
	CI	0.00241	0.00247	0.00288
sky130_osu_sc_12T_ms__addf_l	A	0.00183	0.00172	0.00202
	B	0.00219	0.00215	0.00248
	CI	0.00222	0.00227	0.00273

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00593	0.00600	0.00778
	B	0.00623	0.00636	0.00777
	CI	0.00548	0.00567	0.00714
sky130_osu_sc_12T_ms__addf_l	A	0.00579	0.00584	0.00758
	B	0.00607	0.00620	0.00758
	CI	0.00533	0.00551	0.00695

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01283	0.01285	0.01347
	B	0.01184	0.01153	0.01342
	CI	0.01061	0.01048	0.01124
sky130_osu_sc_12T_ms__addf_l	A	0.01283	0.01286	0.01347
	B	0.01182	0.01153	0.01343
	CI	0.01061	0.01048	0.01124

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__addh_1	18.55920
sky130_osu_sc_12T_ms__addh_l	18.55920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_12T_ms__addh_1	0.00527	0.00552	0.89825	0.92331	0.92799
sky130_osu_sc_12T_ms__addh_l	0.00527	0.00552	0.64309	0.92359	0.65779

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.03131	0.03308
sky130_osu_sc_12T_ms__addh_l	0.00000	0.17147	0.17325

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (RR)	0.13160	0.83472	7.76233
	B->CO (RR)	0.13521	0.83442	7.87140
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.12773	0.87286	7.49378
	B->CO (RR)	0.13113	0.87427	7.61171

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CO (FF)	0.11601	0.73536	6.51514
	B->CO (FF)	0.12159	0.75021	6.59349
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.11399	0.75997	6.33491
	B->CO (FF)	0.11941	0.77650	6.42961

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (RR)	0.18367	0.86710	7.77727
	B->CON (RR)	0.18710	0.86503	7.88446
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.17075	0.84891	7.70612
	B->CON (RR)	0.17420	0.84829	7.82252

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->CON (FF)	0.15123	0.76259	6.62263
	B->CON (FF)	0.15023	0.77144	6.69436
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.14058	0.73970	6.46492
	B->CON (FF)	0.13964	0.75013	6.54937

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (FR)	0.21432	1.58865	17.50940
	B->S (FR)	0.21327	1.59800	17.61960
	CON->S (FR)	0.03525	0.85089	12.01390
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.20350	1.49594	14.55480
	B->S (FR)	0.20257	1.50539	14.63760
	CON->S (FR)	0.03890	0.88460	11.46050

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__addh_1	A->S (RF)	0.23885	1.60369	17.48690
	B->S (RF)	0.24218	1.60092	17.59280
	CON->S (RF)	0.02464	0.61877	8.81679
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.22775	1.46926	13.87270
	B->S (RF)	0.23111	1.46836	13.98400
	CON->S (RF)	0.02740	0.64990	8.61671

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00310	0.00296	0.00349
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00273	0.00308
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00275	0.00257	0.00313
	B	0.00000	0.00000	0.00000
	B	0.00251	0.00234	0.00286

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00435	0.00421	0.00483
	B	0.00000	0.00000	0.00000
	B	0.00455	0.00456	0.00520
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00399	0.00383	0.00456
	B	0.00000	0.00000	0.00000
	B	0.00418	0.00417	0.00491

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00310	0.00296	0.00348
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00273	0.00307
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00275	0.00257	0.00315
	B	0.00000	0.00000	0.00000
	B	0.00251	0.00234	0.00274

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00435	0.00421	0.00479
	B	0.00000	0.00000	0.00000
	B	0.00455	0.00456	0.00517
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00399	0.00382	0.00447
	B	0.00000	0.00000	0.00000
	B	0.00419	0.00417	0.00487

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00436	0.00421	0.00480
	B	0.00000	0.00000	0.00000
	B	0.00455	0.00456	0.00512
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00400	0.00383	0.00464
	B	0.00000	0.00000	0.00000
	B	0.00419	0.00417	0.00497

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00310	0.00296	0.00346
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00273	0.00304
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00274	0.00257	0.00320
	B	0.00000	0.00000	0.00000
	B	0.00251	0.00234	0.00280

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.65556	0.62457	0.17779
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.65561	0.62462	0.17784

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addh_1	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.65546	0.62399	0.17799
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.65551	0.62403	0.17804

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__and2_1	8.30280
sky130_osu_sc_12T_ms__and2_2	10.25640
sky130_osu_sc_12T_ms__and2_4	14.16360
sky130_osu_sc_12T_ms__and2_6	18.07080
sky130_osu_sc_12T_ms__and2_8	21.97800
sky130_osu_sc_12T_ms__and2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__and2_1	0.00280	0.00290	0.90835
sky130_osu_sc_12T_ms__and2_2	0.00280	0.00290	1.79983
sky130_osu_sc_12T_ms__and2_4	0.00280	0.00290	3.48961
sky130_osu_sc_12T_ms__and2_6	0.00284	0.00290	5.17692
sky130_osu_sc_12T_ms__and2_8	0.00280	0.00291	6.77751
sky130_osu_sc_12T_ms__and2_l	0.00214	0.00221	0.65502

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.01374	0.02191
sky130_osu_sc_12T_ms__and2_2	0.00000	0.02192	0.02215
sky130_osu_sc_12T_ms__and2_4	0.00000	0.03830	0.04359
sky130_osu_sc_12T_ms__and2_6	0.00000	0.05468	0.06527
sky130_osu_sc_12T_ms__and2_8	0.00000	0.07105	0.08695
sky130_osu_sc_12T_ms__and2_l	0.00000	0.18900	0.30235

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	A->Y (RR)	0.09999	0.76325	7.49908
	B->Y (RR)	0.10608	0.77654	7.60895
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.11309	0.69651	7.66001
	B->Y (RR)	0.11892	0.69891	7.75952
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.15505	0.70168	8.04030
	B->Y (RR)	0.16105	0.69592	8.12539
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.19716	0.73950	8.39084
	B->Y (RR)	0.20280	0.72816	8.43282
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.23740	0.78202	8.64582
	B->Y (RR)	0.24338	0.76840	8.68675
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.10358	0.81854	7.48632
	B->Y (RR)	0.10940	0.82729	7.52732

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__and2_1	A->Y (FF)	0.09093	0.65817	5.96429
	B->Y (FF)	0.09394	0.67235	6.04693
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.10653	0.63785	6.21367
	B->Y (FF)	0.10877	0.64822	6.29571
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.15130	0.67655	6.66491
	B->Y (FF)	0.15081	0.67827	6.73342
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.19787	0.72415	7.04318
	B->Y (FF)	0.19437	0.72329	7.08573
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.24133	0.76845	7.27055
	B->Y (FF)	0.23555	0.76427	7.30744
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.09048	0.66185	5.53348
	B->Y (FF)	0.09740	0.68083	5.58483

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00216	0.00187	0.00421
	B	0.00000	0.00000	0.00000
	B	0.00221	0.00194	0.00325
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00400	0.00389	0.00622
	B	0.00000	0.00000	0.00000
	B	0.00404	0.00391	0.00529
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00822	0.00843	0.01052
	B	0.00000	0.00000	0.00000
	B	0.00827	0.00847	0.00968
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01252	0.01292	0.01947
	B	0.00000	0.00000	0.00000
	B	0.01254	0.01300	0.01415
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01678	0.01739	0.01949
	B	0.00000	0.00000	0.00000
	B	0.01682	0.01745	0.01898
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00168	0.00150	0.00517
	B	0.00000	0.00000	0.00000
	B	0.00171	0.00149	0.00374

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00541	0.00539	0.00791
	B	0.00000	0.00000	0.00000
	B	0.00613	0.00602	0.00835
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00676	0.00702	0.00945
	B	0.00000	0.00000	0.00000
	B	0.00750	0.00764	0.00989
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01015	0.01096	0.01338
	B	0.00000	0.00000	0.00000
	B	0.01088	0.01156	0.01375
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01363	0.01500	0.01757
	B	0.00000	0.00000	0.00000
	B	0.01443	0.01555	0.01779
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01700	0.01882	0.02147
	B	0.00000	0.00000	0.00000
	B	0.01775	0.01925	0.02163
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00411	0.00414	0.00834
	B	0.00000	0.00000	0.00000
	B	0.00461	0.00466	0.00857

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00182	-0.00184
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00183	-0.00184
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00183	-0.00184
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00184	-0.00184	-0.00186
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00182	-0.00184	-0.00184
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00128	-0.00129	-0.00130

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00184	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00185	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00187	0.00188	0.00187
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00185	0.00186	0.00185
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00129	0.00132	0.00130

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00173	-0.00174	-0.00174
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00173	-0.00174	-0.00174
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00122	-0.00123	-0.00123

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00175	0.00176	0.00174
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00175	0.00176	0.00174
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00175	0.00177	0.00174
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00175	0.00176	0.00174
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00175	0.00176	0.00174
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00124	0.00125	0.00123

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__aoi21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__aoi21_l	0.00255	0.00274	0.00270	0.38877

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00564	0.01090

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (FR)	0.11997	1.11130	11.47820
	A1->Y (FR)	0.09698	1.02443	10.90840
	B0->Y (FR)	0.09270	1.08037	11.64210

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi21_l	A0->Y (RF)	0.05708	0.60765	6.75893
	A1->Y (RF)	0.05244	0.61741	7.08859
	B0->Y (RF)	0.03345	0.56091	6.69669

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00447	0.00441	0.00444
	A1	0.00000	0.00000	0.00000
	A1	0.00376	0.00369	0.00372
	B0	0.00366	0.00358	0.00385

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00096	0.00081	0.00086
	A1	0.00000	0.00000	0.00000
	A1	0.00098	0.00082	0.00094
	B0	-0.00033	-0.00038	-0.00028

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00133	-0.00148	-0.00148
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00150	-0.00151	-0.00150
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00150	-0.00151	-0.00151

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00147	0.00148	0.00148
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00150	0.00153	0.00151
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00152	0.00153	0.00151

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00133	-0.00148	-0.00148
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00150	-0.00152	-0.00151
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00166	-0.00167	-0.00168

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_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)	0.00150	0.00152	0.00151
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00168	0.00171	0.00168

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00075	-0.00076	-0.00075

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00084	0.00084	0.00077

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__aoi22_l	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_12T_ms__aoi22_l	0.00255	0.00273	0.00286	0.00267	0.37758

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.00641	0.02168

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (FR)	0.15341	1.14132	11.35110
	A1->Y (FR)	0.13679	1.11800	11.29130
	B0->Y (FR)	0.09783	1.07294	11.44380
	B1->Y (FR)	0.11480	1.09491	11.51190

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__aoi22_l	A0->Y (RF)	0.07380	0.62087	6.68190
	A1->Y (RF)	0.06904	0.63275	7.00947
	B0->Y (RF)	0.04108	0.59858	6.97018
	B1->Y (RF)	0.04624	0.58800	6.64446

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00553	0.00547	0.00547
	A1	0.00485	0.00475	0.00468
	B0	0.00391	0.00380	0.00411
	B1	0.00461	0.00454	0.00484

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00191	0.00176	0.00178
	A1	0.00192	0.00177	0.00186
	B0	-0.00019	-0.00025	-0.00012
	B1	-0.00016	-0.00024	-0.00018

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00136	-0.00147	-0.00147
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00150	-0.00151	-0.00150
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00150	-0.00151	-0.00150
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00150	-0.00151	-0.00150

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00146	0.00149	0.00147
	(!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)	0.00152	0.00153	0.00151
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00152	0.00153	0.00151

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00136	-0.00148	-0.00148
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00150	-0.00151	-0.00151
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00165	-0.00166	-0.00167
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00165	-0.00166	-0.00167

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00147	0.00150	0.00148
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00151	0.00152	0.00151
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00167	0.00170	0.00168
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00167	0.00170	0.00168

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00075	-0.00076	-0.00075
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00074	-0.00075	-0.00075
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00174	-0.00175	-0.00175
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00174	-0.00175	-0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00088	0.00088	0.00078
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00074	0.00075	0.00075
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00175	0.00176	0.00176
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00175	0.00176	0.00176

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00076	-0.00077	-0.00076
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00075	-0.00076	-0.00076
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00159	-0.00160	-0.00159
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00159	-0.00160	-0.00159

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00088	0.00089	0.00079
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00076	0.00076	0.00076
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00161	0.00162	0.00160
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00161	0.00162	0.00160

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__buf_1	6.34920
sky130_osu_sc_12T_ms__buf_2	8.30280
sky130_osu_sc_12T_ms__buf_4	12.21000
sky130_osu_sc_12T_ms__buf_6	16.11720
sky130_osu_sc_12T_ms__buf_8	20.02440
sky130_osu_sc_12T_ms__buf_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__buf_1	0.00292	0.85201
sky130_osu_sc_12T_ms__buf_2	0.00292	1.76207
sky130_osu_sc_12T_ms__buf_4	0.00291	3.45884
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00291	6.84515
sky130_osu_sc_12T_ms__buf_l	0.00218	0.64806

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.01108	0.01108
sky130_osu_sc_12T_ms__buf_2	0.00000	0.01661	0.02191
sky130_osu_sc_12T_ms__buf_4	0.00000	0.02769	0.04359
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.04983	0.08695
sky130_osu_sc_12T_ms__buf_l	0.00000	0.15123	0.15123

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (RR)**	0.07490	0.74194	7.40832
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.07924	0.64963	7.58781
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.10587	0.63293	7.90340
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.15884	0.67686	8.47179
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.07727	0.77393	7.26957

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__buf_1	**A->Y (FF)**	0.08611	0.63591	5.65361
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.10176	0.62855	6.10348
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.14637	0.66649	6.59746
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.23594	0.76442	7.29264
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.08789	0.65024	5.46438

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00209	0.00172	0.00359
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00392	0.00371	0.00569
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00812	0.00831	0.01029
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01652	0.01733	0.01919
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00163	0.00139	0.00460

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00529	0.00515	0.00756
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00663	0.00671	0.00902
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01002	0.01058	0.01279
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01695	0.01832	0.02062
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00408	0.00417	0.00830

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00046	-0.00046	-0.00044

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
	0.00046	0.00046	0.00044

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dffnr_1	42.49080
sky130_osu_sc_12T_ms__dffnr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffnr_1	0.00266	0.00267	0.00862	0.90524	0.89734
sky130_osu_sc_12T_ms__dffnr_l	0.00266	0.00267	0.00862	0.64809	0.64990

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.11256	0.23628
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.25272	0.37643

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FR)	0.51980	1.88117	16.87090
	QN->Q (FR)	0.03831	0.91720	12.88000
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.50879	1.95057	16.15020
	QN->Q (FR)	0.04100	0.93120	11.98540

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FF)	0.33090	1.73659	18.10200
	QN->Q (RF)	0.02727	0.66190	9.35552
	RN->Q (FF)	0.30182	1.74608	18.31210
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.33280	1.86454	17.70950
	QN->Q (RF)	0.02946	0.68346	9.00696
	RN->Q (FF)	0.30395	1.87527	17.91980

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->QN (FR)	0.28425	1.02623	8.68832
	RN->QN (FR)	0.25499	1.03549	8.90078
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.27990	1.07616	8.55440
	RN->QN (FR)	0.25088	1.08514	8.76359

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	**CK->QN (FF)**	0.45642	1.08963	6.43568
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.44406	1.10592	6.37553

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_ms__dffnr_1	hold	CK (F)	-0.11939	-0.30853	-1.41588
	setup	CK (F)	0.23418	0.33056	1.45312
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11946	-0.30735	-1.41747
	setup	CK (F)	0.23498	0.33056	1.45349

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.10932	-0.14291	-0.69651
	setup	CK (F)	0.24879	0.27239	1.31205
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11038	-0.14379	-0.69695
	setup	CK (F)	0.24839	0.27191	1.31760

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.11939	-0.30853	-1.41588
	setup	CK (F)	0.23418	0.33056	1.45312
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11946	-0.30735	-1.41747
	setup	CK (F)	0.23498	0.33056	1.45349

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	hold	CK (F)	-0.10932	-0.14291	-0.69651
	setup	CK (F)	0.24879	0.27239	1.31205
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.11038	-0.14379	-0.69695
	setup	CK (F)	0.24839	0.27191	1.31760

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	recovery	CK (F)	0.19122	0.18517	-0.29734
	removal	CK (F)	-0.12109	-0.13358	0.30818
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.19150	0.18575	-0.29393
	removal	CK (F)	-0.12109	-0.13358	0.30818

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	recovery	CK (F)	0.19122	0.18517	-0.29734
	removal	CK (F)	-0.12109	-0.13358	0.30818
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.19150	0.18575	-0.29393
	removal	CK (F)	-0.12109	-0.13358	0.30818

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	min_pulse_width	RN ()	0.18902	0.45044	13.33370
	min_pulse_width	RN ()	0.18902	0.45044	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.18223	0.45044	13.33370
	min_pulse_width	RN ()	0.18223	0.45044	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_ms__dffnr_1	min_pulse_width	CK ()	0.22636	0.45044	13.33370
	min_pulse_width	CK ()	0.29427	0.45044	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.22976	0.45044	13.33370
	min_pulse_width	CK ()	0.29427	0.45044	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_ms__dffnr_1	min_pulse_width	CK ()	0.22297	0.45044	13.33370
	min_pulse_width	CK ()	0.16865	0.45044	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.21618	0.45044	13.33370
	min_pulse_width	CK ()	0.16525	0.45044	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01021	0.00965	0.00267
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00967	0.00926	0.00619

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01010	0.00946	0.00550
	RN	-0.00072	-0.03686	-0.50920
	RN	0.01328	0.01267	0.00717
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00954	0.00906	0.00818
	RN	-0.00072	-0.03016	-0.36455
	RN	0.01272	0.01226	0.00990

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01010	0.00945	0.00551
	RN	-0.00072	-0.03666	-0.50475
	RN	0.01328	0.01266	0.00731
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00954	0.00907	0.00811
	RN	-0.00072	-0.03021	-0.36557
	RN	0.01272	0.01227	0.00991

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	CK	0.00000	0.00000	0.00000
	CK	0.01019	0.00963	0.00294
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00965	0.00924	0.00603

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00653	0.00618	0.00709
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00214	0.00184	0.00284
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00166	-0.00167
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00654	0.00618	0.00709
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00214	0.00184	0.00284
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00145	-0.00166	-0.00167

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.01007	0.00987	0.01078
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00543	0.00526	0.00621
	!CK	0.00000	0.00000	0.00000
	!CK	0.00166	0.00168	0.00167
sky130_osu_sc_12T_ms__dffnr_l	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (CK * RN * !Q * QN)	0.01007	0.00988	0.01078
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00543	0.00526	0.00621
	!CK	0.00000	0.00000	0.00000
	!CK	0.00166	0.00168	0.00167

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00666	0.00612	0.00825
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00211	0.00175	0.00381
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00666	0.00612	0.00825
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00211	0.00176	0.00381

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01015	0.00975	0.01205
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00536	0.00520	0.00763
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.01015	0.00975	0.01205
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00536	0.00520	0.00763

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00020	-0.00069	0.00121
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00722	0.00609	0.00980
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00204	0.00114	0.00539
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00853	0.00770	0.00985
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00016	-0.00070	0.00127
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00020	-0.00069	0.00121
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00722	0.00609	0.00979
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00204	0.00114	0.00538
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00853	0.00771	0.00985
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00016	-0.00070	0.00127

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffnr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00844	0.00819	0.01054
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01085	0.01033	0.01526
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00892	0.00859	0.01096
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00844	0.00820	0.01054
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01085	0.01033	0.01526
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00892	0.00859	0.01096

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__dffr_1	42.49080
sky130_osu_sc_12T_ms__dffr_l	42.49080

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_12T_ms__dffr_1	0.00266	0.00267	0.00840	0.89850	0.89958
sky130_osu_sc_12T_ms__dffr_l	0.00266	0.00267	0.00840	0.65072	0.64963

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.11256	0.23646
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.25272	0.37662

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RR)	0.41974	1.65778	15.41440
	QN->Q (FR)	0.03830	0.91466	12.82320
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.40867	1.73486	14.86050
	QN->Q (FR)	0.04100	0.92986	12.01530

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->Q (RF)	0.41630	1.75393	17.10600
	QN->Q (RF)	0.02727	0.66039	9.32076
	RN->Q (FF)	0.30229	1.74228	18.19620
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.41796	1.89186	16.91260
	QN->Q (RF)	0.02946	0.68436	9.02503
	RN->Q (FF)	0.30440	1.87896	17.98650

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	CK->QN (RR)	0.36957	1.04996	7.83371
	RN->QN (FR)	0.25534	1.03720	8.91975
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.36507	1.09942	7.69317
	RN->QN (FR)	0.25124	1.08592	8.76285

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffr_1	**CK->QN (RF)**	0.35630	0.87135	5.10598
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.34372	0.88690	5.02956

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_ms__dffr_1	hold	CK (R)	-0.07053	-0.09803	-0.42775
	setup	CK (R)	0.32217	0.33614	1.42818
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07346	-0.09816	-0.42792
	setup	CK (R)	0.32361	0.34121	1.44309

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.17111	-0.43304	-3.76497
	setup	CK (R)	0.20145	0.44782	3.80466
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.16784	-0.43507	-3.76404
	setup	CK (R)	0.20134	0.44782	3.80465

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.07053	-0.09803	-0.42775
	setup	CK (R)	0.32217	0.33614	1.42818
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07346	-0.09816	-0.42792
	setup	CK (R)	0.32361	0.34121	1.44309

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	hold	CK (R)	-0.17111	-0.43304	-3.76497
	setup	CK (R)	0.20145	0.44782	3.80466
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.16784	-0.43507	-3.76404
	setup	CK (R)	0.20134	0.44782	3.80465

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	0.27764	0.29859	1.37816
	removal	CK (R)	-0.04713	-0.05551	-0.08270
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.28069	0.30020	1.38645
	removal	CK (R)	-0.04713	-0.05551	-0.08270

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	recovery	CK (R)	0.27764	0.29859	1.37816
	removal	CK (R)	-0.04713	-0.05551	-0.08270
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.28069	0.30020	1.38645
	removal	CK (R)	-0.04713	-0.05551	-0.08270

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffr_1	min_pulse_width	RN ()	0.18902	0.45044	13.33370
	min_pulse_width	RN ()	0.18902	0.45044	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.18223	0.45044	13.33370
	min_pulse_width	RN ()	0.18223	0.45044	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_ms__dffr_1	min_pulse_width	CK ()	0.18223	0.45044	13.33370
	min_pulse_width	CK ()	0.22636	0.45044	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.17204	0.45044	13.33370
	min_pulse_width	CK ()	0.22297	0.45044	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_ms__dffr_1	min_pulse_width	CK ()	0.41606	0.48154	13.33370
	min_pulse_width	CK ()	0.16865	0.45044	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.41796	0.48376	13.33370
	min_pulse_width	CK ()	0.16865	0.45044	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00543	0.00451	0.00000
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00489	0.00412	0.00193

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00610	0.00535	0.00000
	RN	-0.00072	-0.03669	-0.50541
	RN	0.01381	0.01319	0.00784
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00554	0.00496	0.00255
	RN	-0.00072	-0.03023	-0.36603
	RN	0.01325	0.01280	0.01043

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00610	0.00535	0.00000
	RN	-0.00072	-0.03672	-0.50602
	RN	0.01381	0.01320	0.00779
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00554	0.00496	0.00260
	RN	-0.00072	-0.03020	-0.36542
	RN	0.01325	0.01280	0.01042

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00540	0.00449	0.00000
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00486	0.00410	0.00169

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00127	-0.00149	-0.00150
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00665	0.00629	0.00720
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00265	0.00235	0.00335
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00127	-0.00149	-0.00150
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00665	0.00630	0.00720
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00265	0.00235	0.00335

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00148	0.00150	0.00150
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00996	0.00976	0.01068
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00492	0.00476	0.00571
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00149	0.00150	0.00150
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00996	0.00976	0.01068
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00492	0.00476	0.00571

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00211	0.00175	0.00381
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00631	0.00577	0.00790
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00211	0.00176	0.00381
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00631	0.00577	0.00790

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00536	0.00520	0.00763
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01050	0.01010	0.01240
sky130_osu_sc_12T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00536	0.00520	0.00763
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01050	0.01010	0.01240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00032	-0.00083	0.00112
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00338	0.00257	0.00440
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00036	-0.00088	0.00111
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00032	-0.00083	0.00112
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00338	0.00259	0.00440
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00036	-0.00088	0.00111

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00830	0.00800	0.01046
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01667	0.01603	0.01814
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01245	0.01208	0.01423
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01637	0.01577	0.02062
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00885	0.00852	0.01095
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00830	0.00799	0.01046
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01667	0.01604	0.01814
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01245	0.01208	0.01423
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01637	0.01575	0.02062
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00885	0.00852	0.01095

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__dffsr_1	46.39800
sky130_osu_sc_12T_ms__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_ms__dffsr_1	0.00263	0.00268	0.00626	0.00853	0.93017	0.93049
sky130_osu_sc_12T_ms__dffsr_l	0.00263	0.00268	0.00626	0.00853	0.64540	0.64995

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.04117	0.05619
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.18133	0.19635

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RR)	0.44972	1.70663	15.83610
	QN->Q (FR)	0.03619	0.88830	12.57210
	RN->Q (RR)	0.36373	1.63637	15.91010
	SN->Q (FR)	0.33862	1.69740	17.37830
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.44542	1.77938	14.88820
	QN->Q (FR)	0.04091	0.92927	11.95090
	RN->Q (RR)	0.35947	1.71029	14.95900
	SN->Q (FR)	0.33639	1.77031	16.39740

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->Q (RF)	0.48287	1.82769	17.41320
	QN->Q (RF)	0.02707	0.66690	9.47851
	RN->Q (FF)	0.31963	1.76531	18.51440
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.48592	1.96000	16.87040
	QN->Q (RF)	0.02931	0.68186	8.98196
	RN->Q (FF)	0.32385	1.89720	17.95020

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RR)	0.43518	1.11683	7.92858
	RN->QN (FR)	0.27293	1.05530	9.02334
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.43159	1.17342	7.78897
	RN->QN (FR)	0.27046	1.11182	8.86849

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffsr_1	CK->QN (RF)	0.38932	0.92218	5.38243
	RN->QN (RF)	0.30362	0.85338	5.45797
	SN->QN (FF)	0.28084	0.91424	6.92373
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.38189	0.93802	5.17153
	RN->QN (RF)	0.29624	0.86989	5.24039
	SN->QN (FF)	0.27334	0.93002	6.68229

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_ms__dffsr_1	hold	CK (R)	-0.08625	-0.11445	-0.53687
	setup	CK (R)	0.33599	0.34632	1.45128
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.08549	-0.11400	-0.53682
	setup	CK (R)	0.33718	0.34632	1.45950

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.19718	-0.45851	-3.94245
	setup	CK (R)	0.24318	0.47203	3.97277
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.19786	-0.45770	-3.94168
	setup	CK (R)	0.24302	0.47201	3.97274

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.08625	-0.11445	-0.53687
	setup	CK (R)	0.33599	0.34632	1.45128
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.08549	-0.11400	-0.53682
	setup	CK (R)	0.33718	0.34632	1.45950

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	hold	CK (R)	-0.19718	-0.45851	-3.94245
	setup	CK (R)	0.24318	0.47203	3.97277
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.19786	-0.45770	-3.94168
	setup	CK (R)	0.24302	0.47201	3.97274

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.26871	0.28110	1.33941
	removal	CK (R)	-0.03602	-0.04571	-0.11898
	hold	SN (R)	-0.27175	-0.46927	-2.71453
	setup	SN (R)	0.30071	0.51378	5.13565
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.26715	0.28181	1.34352
	removal	CK (R)	-0.03602	-0.04571	-0.11898
	hold	SN (R)	-0.26267	-0.45754	-2.64941
	setup	SN (R)	0.30086	0.50011	5.02725

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.26871	0.28110	1.33941
	removal	CK (R)	-0.03602	-0.04571	-0.11898
	hold	SN (R)	-0.27289	-0.46927	-2.71453
	hold	SN (R)	-0.27175	-0.47055	-2.72032
	setup	SN (R)	0.29798	0.50928	4.95750
	setup	SN (R)	0.30071	0.51378	5.13565
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.26715	0.28181	1.34352
	removal	CK (R)	-0.03602	-0.04571	-0.11898
	hold	SN (R)	-0.26318	-0.45754	-2.64941
	hold	SN (R)	-0.26267	-0.45860	-2.65408
	setup	SN (R)	0.30086	0.50011	4.83538
	setup	SN (R)	0.28727	0.50000	5.02725

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	RN ()	0.21278	0.45044	13.33370
	min_pulse_width	RN ()	0.21957	0.45044	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.21278	0.45044	13.33370
	min_pulse_width	RN ()	0.21618	0.45044	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_ms__dffsr_1	recovery	CK (R)	0.05008	0.08368	3.04140
	removal	CK (R)	-0.01674	-0.05599	-0.45175
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.05078	0.08346	2.88371
	removal	CK (R)	-0.01674	-0.05599	-0.45175

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	recovery	CK (R)	0.05008	0.08368	3.04140
	removal	CK (R)	-0.01674	-0.05599	-0.45175
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.05078	0.08346	2.88371
	removal	CK (R)	-0.01674	-0.05599	-0.45175

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	min_pulse_width	SN ()	0.26814	0.51264	13.33370
	min_pulse_width	SN ()	0.27978	0.51264	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.26776	0.49709	13.33370
	min_pulse_width	SN ()	0.26514	0.49931	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_ms__dffsr_1	min_pulse_width	CK ()	0.20260	0.45044	13.33370
	min_pulse_width	CK ()	0.25013	0.45044	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.19581	0.45044	13.33370
	min_pulse_width	CK ()	0.24674	0.45044	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_ms__dffsr_1	min_pulse_width	CK ()	0.43285	0.48820	13.33370
	min_pulse_width	CK ()	0.21278	0.45044	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.43481	0.49043	13.33370
	min_pulse_width	CK ()	0.21278	0.45044	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00668	0.00578	-0.00031
	RN	0.01218	0.01145	0.00420
	SN	-0.00072	-0.03746	-0.52322
	SN	0.01348	0.01274	0.00504
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00617	0.00544	0.00320
	RN	0.01167	0.01110	0.00777
	SN	-0.00072	-0.03008	-0.36304
	SN	0.01297	0.01238	0.00850

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00707	0.00651	0.00277
	RN	-0.00072	-0.03746	-0.52322
	RN	0.01453	0.01401	0.01025
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00652	0.00600	0.00366
	RN	-0.00072	-0.03008	-0.36304
	RN	0.01398	0.01349	0.01126

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00706	0.00650	0.00274
	RN	-0.00072	-0.03747	-0.52340
	RN	0.01453	0.01401	0.01026
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00652	0.00600	0.00368
	RN	-0.00072	-0.03021	-0.36559
	RN	0.01398	0.01348	0.01120

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00665	0.00576	-0.00041
	RN	0.01216	0.01142	0.00419
	SN	-0.00072	-0.03747	-0.52338
	SN	0.01345	0.01271	0.00503
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00614	0.00541	0.00295
	RN	0.01164	0.01107	0.00762
	SN	-0.00072	-0.03021	-0.36558
	SN	0.01294	0.01235	0.00862

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00147	-0.00151	-0.00150
	(!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)	0.00831	0.00798	0.00889
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00288	0.00258	0.00354
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00286	0.00257	0.00353
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00289	0.00260	0.00356
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00147	-0.00151	-0.00151
	(!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)	0.00831	0.00798	0.00889
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00288	0.00258	0.00354
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00286	0.00257	0.00353
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00289	0.00260	0.00356

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00152	0.00151	0.00150
	(!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)	0.01149	0.01129	0.01207
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00538	0.00525	0.00620
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00541	0.00527	0.00622
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00536	0.00523	0.00618
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00152	0.00152	0.00151
	(!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)	0.01149	0.01129	0.01207
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00538	0.00525	0.00620
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00541	0.00527	0.00622
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00536	0.00523	0.00618

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00178	0.00141	0.00336
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00746	0.00693	0.00875
sky130_osu_sc_12T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00178	0.00142	0.00336
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00747	0.00693	0.00876

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00584	0.00571	0.00820
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01112	0.01078	0.01300
sky130_osu_sc_12T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00585	0.00571	0.00820
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01112	0.01078	0.01300

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00387	-0.00389	-0.00390
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00393	-0.00421	-0.00421
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00375	-0.00392	-0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00185	0.00150	0.00270
sky130_osu_sc_12T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00387	-0.00389	-0.00390
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00393	-0.00421	-0.00421
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00375	-0.00392	-0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00186	0.00151	0.00270

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00391	0.00399	0.00392
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00420	0.00422	0.00421
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00391	0.00393	0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00899	0.00875	0.00951
sky130_osu_sc_12T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00392	0.00390	0.00392
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00421	0.00422	0.00421
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00391	0.00393	0.00391
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00899	0.00876	0.00951

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00037	-0.00088	0.00106
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00399	0.00322	0.00504
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00394	0.00315	0.00501
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00026	-0.00077	0.00119
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00206	0.00120	0.00525
sky130_osu_sc_12T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00036	-0.00088	0.00106
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00399	0.00320	0.00504
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00394	0.00315	0.00501
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00026	-0.00077	0.00119
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00206	0.00120	0.00525

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_12T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01856	0.01795	0.02000
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00845	0.00814	0.01059
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01263	0.01226	0.01441
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01268	0.01229	0.01443
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01797	0.01729	0.02200
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00885	0.00851	0.01094
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01129	0.01073	0.01570
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01856	0.01795	0.02000
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00845	0.00814	0.01059
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01263	0.01226	0.01442
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01268	0.01229	0.01443
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01797	0.01729	0.02200
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00886	0.00851	0.01094
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01129	0.01073	0.01571

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__dffs_1	38.58360
sky130_osu_sc_12T_ms__dffs_l	38.58360

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_12T_ms__dffs_1	0.00264	0.00517	0.00844	0.89676	0.89983
sky130_osu_sc_12T_ms__dffs_l	0.00264	0.00518	0.00844	0.64691	0.65073

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.22882	0.62713
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.36898	0.76728

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RR)	0.30200	1.51945	15.23260
	QN->Q (FR)	0.03831	0.91176	12.76770
	SN->Q (FR)	0.23608	1.56311	16.21090
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.29985	1.60696	14.64100
	QN->Q (FR)	0.04096	0.92555	11.94560
	SN->Q (FR)	0.23277	1.64455	15.58950

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->Q (RF)	0.46323	1.80421	17.09210
	QN->Q (RF)	0.02715	0.65777	9.28933
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.46056	1.93077	16.84600
	QN->Q (RF)	0.02937	0.68137	8.98225

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RR)	0.41439	1.10050	7.87053
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.40569	1.14570	7.73908

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffs_1	CK->QN (RF)	0.24653	0.73914	4.97130
	SN->QN (FF)	0.17939	0.78306	5.95403
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.24164	0.76668	4.91148
	SN->QN (FF)	0.17387	0.80492	5.86286

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_ms__dffs_1	hold	CK (R)	-0.05771	-0.08289	-0.38408
	setup	CK (R)	0.21491	0.24181	1.39297
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.05613	-0.08263	-0.38329
	setup	CK (R)	0.21505	0.24198	1.40590

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.17828	-0.44015	-3.81200
	setup	CK (R)	0.22587	0.45471	3.85046
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.17734	-0.43921	-3.81036
	setup	CK (R)	0.22601	0.45471	3.85048

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.05771	-0.08289	-0.38408
	setup	CK (R)	0.21491	0.24181	1.39297
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.05613	-0.08263	-0.38329
	setup	CK (R)	0.21505	0.24198	1.40590

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	hold	CK (R)	-0.17828	-0.44015	-3.81200
	setup	CK (R)	0.22587	0.45471	3.85046
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.17734	-0.43921	-3.81036
	setup	CK (R)	0.22601	0.45471	3.85048

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.05699	0.08725	2.18852
	removal	CK (R)	-0.02642	-0.06002	-0.47913
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.05722	0.08725	2.01236
	removal	CK (R)	-0.02642	-0.06002	-0.47913

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	recovery	CK (R)	0.05699	0.08725	2.18852
	removal	CK (R)	-0.02642	-0.06002	-0.47913
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.05722	0.08725	2.01236
	removal	CK (R)	-0.02642	-0.06002	-0.47913

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dffs_1	min_pulse_width	SN ()	0.16484	0.45932	13.33370
	min_pulse_width	SN ()	0.16484	0.45932	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.15846	0.45044	13.33370
	min_pulse_width	SN ()	0.15846	0.45044	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_ms__dffs_1	min_pulse_width	CK ()	0.12112	0.45044	13.33370
	min_pulse_width	CK ()	0.23655	0.45044	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.11772	0.45044	13.33370
	min_pulse_width	CK ()	0.22976	0.45044	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_ms__dffs_1	min_pulse_width	CK ()	0.31124	0.45044	13.33370
	min_pulse_width	CK ()	0.19920	0.45044	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.31124	0.45044	13.33370
	min_pulse_width	CK ()	0.19920	0.45044	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00544	0.00449	-0.00010
	SN	-0.00072	-0.03665	-0.50443
	SN	0.01154	0.01076	0.00679
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00489	0.00410	0.00191
	SN	-0.00072	-0.03013	-0.36389
	SN	0.01099	0.01037	0.00978

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00606	0.00536	0.00010
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00551	0.00496	0.00267

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00606	0.00535	0.00012
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00551	0.00497	0.00270

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00541	0.00447	-0.00012
	SN	-0.00072	-0.03672	-0.50613
	SN	0.01152	0.01074	0.00645
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00486	0.00407	0.00174
	SN	-0.00072	-0.03023	-0.36602
	SN	0.01096	0.01034	0.00966

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00149	-0.00153	-0.00153
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00649	0.00612	0.00716
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00263	0.00233	0.00331
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00149	-0.00153	-0.00153
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00649	0.00612	0.00716
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00263	0.00233	0.00331

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00154	0.00154	0.00153
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00986	0.00963	0.01053
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00495	0.00480	0.00579
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00154	0.00154	0.00153
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00986	0.00963	0.01053
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00495	0.00481	0.00579

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00285	-0.00287	-0.00287
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00189	0.00156	0.00412
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00285	-0.00287	-0.00287
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00189	0.00156	0.00412

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00289	0.00289	0.00288
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00630	0.00606	0.00985
sky130_osu_sc_12T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00289	0.00290	0.00288
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00631	0.00606	0.00985

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00032	-0.00083	0.00112
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00030	-0.00082	0.00117
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00186	0.00102	0.00518
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00032	-0.00083	0.00112
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00030	-0.00082	0.00117
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00186	0.00102	0.00518

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01659	0.01596	0.01811
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00830	0.00799	0.01046
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01618	0.01546	0.02030
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00880	0.00848	0.01090
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01069	0.01016	0.01519
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01660	0.01596	0.01811
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00831	0.00797	0.01046
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01618	0.01544	0.02030
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00880	0.00848	0.01090
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01069	0.01016	0.01519

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__dff_1	32.23440
sky130_osu_sc_12T_ms__dff_l	32.23440

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	D	CK	Q
sky130_osu_sc_12T_ms__dff_1	0.00279	0.00832	0.82712
sky130_osu_sc_12T_ms__dff_l	0.00279	0.00832	0.61454

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.03680	0.04515
sky130_osu_sc_12T_ms__dff_l	0.00000	0.17696	0.18531

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	**CK->Q (RR)**	0.26015	0.93951	7.55938
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.25734	0.98965	7.45352

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dff_1	**CK->Q (RF)**	0.38907	0.87075	4.91173
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.38737	0.90780	4.97369

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_ms__dff_1	hold	CK (R)	-0.06106	-0.08800	-0.43999
	setup	CK (R)	0.17694	0.20491	1.39672
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.05825	-0.08800	-0.43599
	setup	CK (R)	0.17700	0.20587	1.40536

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	hold	CK (R)	-0.16138	-0.44001	-3.82978
	setup	CK (R)	0.19560	0.45630	3.87447
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.16159	-0.43842	-3.83019
	setup	CK (R)	0.19560	0.45630	3.87568

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_12T_ms__dff_1	min_pulse_width	CK ()	0.11093	0.45044	13.33370
	min_pulse_width	CK ()	0.21957	0.45044	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.11093	0.45044	13.33370
	min_pulse_width	CK ()	0.21618	0.45044	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_ms__dff_1	**min_pulse_width**	**CK ()**	0.27389	0.45044	13.33370
	min_pulse_width	**CK ()**	0.15846	0.45044	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.27389	0.45044	13.33370
	min_pulse_width	**CK ()**	0.15846	0.45044	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01144	0.01038	0.01413
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01032	0.00926	0.01306

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01239	0.01168	0.01342
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01128	0.01056	0.01240

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00126	-0.00148	-0.00149
	!CK	0.00000	0.00000	0.00000
	!CK	0.00592	0.00554	0.00646
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00126	-0.00148	-0.00149
	!CK	0.00000	0.00000	0.00000
	!CK	0.00592	0.00554	0.00646

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00147	0.00149	0.00149
	!CK	0.00000	0.00000	0.00000
	!CK	0.01021	0.00995	0.01088
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00148	0.00149	0.00149
	!CK	0.00000	0.00000	0.00000
	!CK	0.01021	0.00995	0.01089

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00034	-0.00085	0.00110
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00030	-0.00082	0.00118
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00034	-0.00085	0.00110
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00030	-0.00082	0.00118

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__dff_1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00828	0.00797	0.01045
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01601	0.01538	0.01758
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01642	0.01567	0.02059
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00874	0.00842	0.01085
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00828	0.00797	0.01045
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01601	0.01538	0.01758
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01642	0.01567	0.02059
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00875	0.00842	0.01085

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__inv_1	4.39560
sky130_osu_sc_12T_ms__inv_10	21.97800
sky130_osu_sc_12T_ms__inv_2	6.34920
sky130_osu_sc_12T_ms__inv_3	8.30280
sky130_osu_sc_12T_ms__inv_4	10.25640
sky130_osu_sc_12T_ms__inv_6	14.16360
sky130_osu_sc_12T_ms__inv_8	18.07080
sky130_osu_sc_12T_ms__inv_l	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_12T_ms__inv_1	0.00271	0.83732
sky130_osu_sc_12T_ms__inv_10	0.02407	8.36852
sky130_osu_sc_12T_ms__inv_2	0.00501	1.72817
sky130_osu_sc_12T_ms__inv_3	0.00741	2.53870
sky130_osu_sc_12T_ms__inv_4	0.00975	3.42830
sky130_osu_sc_12T_ms__inv_6	0.01460	5.11180
sky130_osu_sc_12T_ms__inv_8	0.01933	6.77487
sky130_osu_sc_12T_ms__inv_l	0.00214	0.58765

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00554	0.01084
sky130_osu_sc_12T_ms__inv_10	0.00000	0.05537	0.10840
sky130_osu_sc_12T_ms__inv_2	0.00000	0.01107	0.02168
sky130_osu_sc_12T_ms__inv_3	0.00000	0.01661	0.03252
sky130_osu_sc_12T_ms__inv_4	0.00000	0.02215	0.04336
sky130_osu_sc_12T_ms__inv_6	0.00000	0.03322	0.06504
sky130_osu_sc_12T_ms__inv_8	0.00000	0.04430	0.08672
sky130_osu_sc_12T_ms__inv_l	0.00000	0.07562	0.15112

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (FR)**	0.03710	0.85670	11.79540
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.03873	0.56080	11.75870
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.02683	0.71910	11.75280
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.02830	0.67372	11.77310
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.02740	0.63626	11.75630
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.02981	0.59657	11.75950
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.03387	0.57407	11.75430
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.04119	0.87408	11.01550

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__inv_1	**A->Y (RF)**	0.02504	0.59893	8.34527
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.03021	0.41215	8.58809
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.01964	0.53008	8.49978
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.02088	0.50014	8.58080
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02032	0.47340	8.59717
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02334	0.44635	8.62310
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02663	0.42713	8.62521
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02815	0.62375	8.12944

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00268	0.00268	0.00293
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.02174	0.02237	0.02514
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00459	0.00408	0.00522
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00706	0.00712	0.00802
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00896	0.00910	0.01032
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01326	0.01373	0.01545
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01753	0.01795	0.02052
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00211	0.00213	0.00269

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00040	-0.00044	-0.00033
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00771	-0.00730	-0.00533
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00141	-0.00143	-0.00115
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00181	-0.00185	-0.00139
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00289	-0.00281	-0.00220
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00441	-0.00428	-0.00327
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00602	-0.00590	-0.00431
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00029	-0.00031	-0.00023

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__mux2_1	12.21000

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_12T_ms__mux2_1	0.09280	0.09269	0.00558	0.08909

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.01120	0.01120

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (RR)	-	0.01772	0.31912	3.15143
	A1->Y (RR)	-	0.02124	0.32193	3.15762
	S0->Y (RR)	(!A0 * A1)	0.05916	0.32845	1.14541
	S0->Y (FR)	(A0 * !A1)	0.03917	0.43716	3.17359

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__mux2_1	A0->Y (FF)	-	0.01965	0.28778	2.73112
	A1->Y (FF)	-	0.01710	0.28475	2.72651
	S0->Y (FF)	(!A0 * A1)	0.08328	0.40875	2.08982
	S0->Y (RF)	(A0 * !A1)	0.02726	0.32021	2.15803

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00264	-0.00264	-0.00264
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00173	-0.00173	-0.00173
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00358	0.00344	0.00624
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00164	-0.00204	0.00032

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00264	0.00264	0.00264
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00173	0.00173	0.00173
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00051	0.00012	0.00258
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00717	0.00700	0.00964

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00065	-0.00065	-0.00065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00065	0.00065	0.00065

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00077	-0.00077	-0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00077	0.00077	0.00077

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00058	-0.00097	0.00146
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00056	-0.00095	0.00146

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00556	0.00535	0.00807
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00519	0.00502	0.00783

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nand2_1	6.34920
sky130_osu_sc_12T_ms__nand2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00269	0.00269	0.83260
sky130_osu_sc_12T_ms__nand2_l	0.00209	0.00212	0.58529

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00555	0.02168
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.07563	0.30224

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (FR)	0.03874	0.85926	11.79380
	B->Y (FR)	0.04392	0.83182	11.35350
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.04156	0.87550	11.00950
	B->Y (FR)	0.04930	0.88142	10.99780

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nand2_1	A->Y (RF)	0.03877	0.77800	10.59330
	B->Y (RF)	0.04398	0.76895	10.31340
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.04285	0.82003	10.24890
	B->Y (RF)	0.04772	0.81232	9.92742

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00283	0.00283	0.00299
	B	0.00000	0.00000	0.00000
	B	0.00357	0.00354	0.00372
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00213	0.00215	0.00265
	B	0.00000	0.00000	0.00000
	B	0.00265	0.00265	0.00315

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00025	-0.00028	-0.00020
	B	0.00000	0.00000	0.00000
	B	-0.00023	-0.00029	-0.00024
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00015	-0.00019	-0.00010
	B	0.00000	0.00000	0.00000
	B	-0.00014	-0.00019	-0.00014

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00175	-0.00175	-0.00177
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00125	-0.00125	-0.00125

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00176	0.00179	0.00177
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00125	0.00127	0.00126

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00162	-0.00163	-0.00162
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00116	-0.00117	-0.00117

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00164	0.00165	0.00163
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00117	0.00118	0.00117

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__nor2_1	6.34920
sky130_osu_sc_12T_ms__nor2_l	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nor2_1	0.00266	0.00293	0.42912
sky130_osu_sc_12T_ms__nor2_l	0.00201	0.00223	0.31063

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00438	0.01084
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.05106	0.15112

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (FR)	0.08626	1.05014	11.55840
	B->Y (FR)	0.07023	1.02543	11.56430
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.08926	1.09343	11.03120
	B->Y (FR)	0.07678	1.05238	10.80950

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__nor2_1	A->Y (RF)	0.03226	0.50733	6.12755
	B->Y (RF)	0.02659	0.50018	6.11188
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.03415	0.53094	6.01321
	B->Y (RF)	0.02932	0.52365	5.99973

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00366	0.00359	0.00365
	B	0.00000	0.00000	0.00000
	B	0.00295	0.00288	0.00320
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00266	0.00260	0.00277
	B	0.00000	0.00000	0.00000
	B	0.00222	0.00220	0.00302

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00042	0.00031	0.00043
	B	0.00000	0.00000	0.00000
	B	-0.00031	-0.00034	-0.00021
sky130_osu_sc_12T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00031	0.00023	0.00037
	B	0.00000	0.00000	0.00000
	B	-0.00020	-0.00021	-0.00009

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00127	-0.00150	-0.00150
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00082	-0.00101	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00150	0.00151	0.00150
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00103	0.00104	0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00075	-0.00076	-0.00075
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00053	-0.00053	-0.00053

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00080	0.00081	0.00077
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00056	0.00056	0.00054

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__oai21_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_12T_ms__oai21_l	0.00269	0.00278	0.00238	0.42373

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.05895	0.16196

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (FR)	0.09816	1.05008	11.53040
	A1->Y (FR)	0.11823	1.08132	11.52450
	B0->Y (FR)	0.05232	0.78509	9.23050

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai21_l	A0->Y (RF)	0.05291	0.62878	7.15537
	A1->Y (RF)	0.06223	0.62797	7.06623
	B0->Y (RF)	0.04181	0.64282	7.63743

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00402	0.00394	0.00422
	A1	0.00000	0.00000	0.00000
	A1	0.00478	0.00469	0.00472
	B0	0.00323	0.00322	0.00400

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00023	0.00017	0.00022
	A1	0.00000	0.00000	0.00000
	A1	0.00099	0.00084	0.00089
	B0	0.00126	0.00120	0.00131

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00075	-0.00076	-0.00076
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00150	-0.00152	-0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00155	-0.00156	-0.00156

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00080	0.00081	0.00077
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00152	0.00152	0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00156	0.00157	0.00156

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00122	-0.00145	-0.00145
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00148	-0.00152	-0.00151
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00153	-0.00153	-0.00154

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00144	0.00145	0.00145
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00150	0.00152	0.00151
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00154	0.00153	0.00154

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00130	-0.00131	-0.00134

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00134	0.00137	0.00134

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__oai22_1	10.25640

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_12T_ms__oai22_1	0.00252	0.00265	0.00283	0.00280	0.45187

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00657	0.02168

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (FR)	0.12588	1.09038	11.71700
	A1->Y (FR)	0.10959	1.06233	11.73600
	B0->Y (FR)	0.07406	1.02678	11.70380
	B1->Y (FR)	0.09199	1.05400	11.68620

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__oai22_l	A0->Y (RF)	0.08236	0.68142	7.46409
	A1->Y (RF)	0.06803	0.66187	7.42116
	B0->Y (RF)	0.05749	0.67519	7.90338
	B1->Y (RF)	0.07265	0.69232	7.96169

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00605	0.00597	0.00600
	A1	0.00529	0.00521	0.00548
	B0	0.00386	0.00381	0.00408
	B1	0.00467	0.00459	0.00461

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00146	0.00133	0.00137
	A1	0.00077	0.00071	0.00073
	B0	0.00075	0.00069	0.00078
	B1	0.00146	0.00132	0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00124	-0.00146	-0.00147
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00124	-0.00146	-0.00147
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00143	-0.00146	-0.00146
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00148	-0.00149	-0.00149

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00146	0.00148	0.00147
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00146	0.00148	0.00147
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00146	0.00148	0.00146
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00149	0.00150	0.00149

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00073	-0.00074	-0.00074
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00073	-0.00074	-0.00074
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00143	-0.00145	-0.00145
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00148	-0.00148	-0.00148

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00078	0.00079	0.00075
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00078	0.00079	0.00075
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00144	0.00145	0.00145
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00149	0.00150	0.00149

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00074	-0.00075	-0.00074
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00074	-0.00076	-0.00074
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00170	-0.00173	-0.00172
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00169	-0.00171	-0.00175

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00079	0.00080	0.00076
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00079	0.00079	0.00076
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00173	0.00173	0.00172
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00175	0.00179	0.00176

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00123	-0.00144	-0.00145
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00123	-0.00144	-0.00146
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00173	-0.00176	-0.00176
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00173	-0.00173	-0.00178

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00145	0.00146	0.00145
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00145	0.00146	0.00146
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00177	0.00179	0.00176
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00179	0.00181	0.00179

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__or2_1	8.30280
sky130_osu_sc_12T_ms__or2_2	10.25640
sky130_osu_sc_12T_ms__or2_4	14.16360
sky130_osu_sc_12T_ms__or2_8	21.97800
sky130_osu_sc_12T_ms__or2_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__or2_1	0.00301	0.00277	0.84458
sky130_osu_sc_12T_ms__or2_2	0.00301	0.00277	1.74988
sky130_osu_sc_12T_ms__or2_4	0.00301	0.00277	3.44210
sky130_osu_sc_12T_ms__or2_8	0.00300	0.00277	6.76706
sky130_osu_sc_12T_ms__or2_l	0.00227	0.00212	0.61574

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00727	0.01131
sky130_osu_sc_12T_ms__or2_2	0.00000	0.01015	0.02215
sky130_osu_sc_12T_ms__or2_4	0.00000	0.01592	0.04383
sky130_osu_sc_12T_ms__or2_8	0.00000	0.02746	0.08719
sky130_osu_sc_12T_ms__or2_l	0.00000	0.08893	0.15134

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (RR)	0.08563	0.77264	7.49781
	B->Y (RR)	0.07653	0.74494	7.36302
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.09079	0.68033	7.68305
	B->Y (RR)	0.08121	0.65466	7.55902
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.11769	0.65665	8.00331
	B->Y (RR)	0.10795	0.63802	7.90595
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.17065	0.69447	8.53764
	B->Y (RR)	0.16064	0.68029	8.45526
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.08885	0.82265	7.34186
	B->Y (RR)	0.08033	0.79240	7.27466

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__or2_1	A->Y (FF)	0.16672	0.74842	6.08412
	B->Y (FF)	0.14222	0.71191	5.82005
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.20179	0.75449	6.57173
	B->Y (FF)	0.17727	0.72617	6.30776
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.28777	0.83181	7.13086
	B->Y (FF)	0.26340	0.80480	6.90050
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.45947	1.02018	7.84668
	B->Y (FF)	0.43518	0.98892	7.69266
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.17117	0.76938	5.76600
	B->Y (FF)	0.14915	0.72178	5.47288

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00293	0.00257	0.00392
	B	0.00000	0.00000	0.00000
	B	0.00220	0.00194	0.00382
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00478	0.00457	0.00615
	B	0.00000	0.00000	0.00000
	B	0.00402	0.00402	0.00573
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00901	0.00917	0.01072
	B	0.00000	0.00000	0.00000
	B	0.00823	0.00863	0.01068
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01743	0.01813	0.01971
	B	0.00000	0.00000	0.00000
	B	0.01667	0.01778	0.01975
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00224	0.00199	0.00358
	B	0.00000	0.00000	0.00000
	B	0.00172	0.00158	0.00422

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00628	0.00606	0.00697
	B	0.00000	0.00000	0.00000
	B	0.00531	0.00530	0.00765
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00764	0.00772	0.00854
	B	0.00000	0.00000	0.00000
	B	0.00668	0.00690	0.00911
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01106	0.01160	0.01243
	B	0.00000	0.00000	0.00000
	B	0.01015	0.01069	0.01287
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01822	0.01915	0.02034
	B	0.00000	0.00000	0.00000
	B	0.01745	0.01826	0.02066
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00468	0.00453	0.00603
	B	0.00000	0.00000	0.00000
	B	0.00401	0.00416	0.00795

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00129	-0.00152	-0.00152
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00152	-0.00152
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00152	-0.00152
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00128	-0.00152	-0.00152
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00082	-0.00102	-0.00103

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00151	0.00152	0.00152
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00151	0.00152	0.00152
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00151	0.00152	0.00152
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00151	0.00152	0.00152
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00103	0.00104	0.00104

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00075	-0.00076	-0.00076
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00075	-0.00076	-0.00076
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00075	-0.00076	-0.00076
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00075	-0.00076	-0.00076
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00052	-0.00052	-0.00052

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00081	0.00077
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00081	0.00077
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00081	0.00077
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00081	0.00082	0.00077
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00055	0.00055	0.00053

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tbufi_1	8.30280
sky130_osu_sc_12T_ms__tbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tbufi_1	0.00290	0.00381	0.44451
sky130_osu_sc_12T_ms__tbufi_l	0.00224	0.00292	0.31284

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00570	0.02168
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.07571	0.30224

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (FR)	0.06459	1.01290	11.57910
	OE->Y (FR)	0.05586	0.29630	4.44507
	OE->Y (RR)	0.10414	0.91073	7.46336
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.07354	1.05373	10.85790
	OE->Y (FR)	0.05531	0.29621	4.44505
	OE->Y (RR)	0.11019	0.97888	7.32512

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tbufi_1	A->Y (RF)	0.03788	0.62452	7.55582
	OE->Y (FF)	0.05723	0.29634	4.44508
	OE->Y (RF)	0.03624	0.60844	7.21505
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.04238	0.65705	7.33370
	OE->Y (FF)	0.05662	0.29625	4.44504
	OE->Y (RF)	0.03986	0.63448	6.95523

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00273	0.00267	0.00295
	OE	0.00000	0.00000	0.00000
	OE	0.00262	0.00227	0.00470
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00207	0.00205	0.00278
	OE	0.00000	0.00000	0.00000
	OE	0.00192	0.00168	0.00551

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00032	-0.00034	-0.00023
	OE	0.00000	0.00000	0.00000
	OE	0.00167	0.00132	0.00390
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00019	-0.00021	-0.00010
	OE	0.00000	0.00000	0.00000
	OE	0.00118	0.00095	0.00507

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00128	-0.00129	-0.00129
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00116	-0.00118	-0.00116
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00093	-0.00093	-0.00093
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00084	-0.00085	-0.00084

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00128	0.00129	0.00129
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00120	0.00121	0.00118
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00093	0.00093	0.00093
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00087	0.00087	0.00085

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00098	0.00065	0.00323
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00086	0.00051	0.00310
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00070	0.00046	0.00463
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00060	0.00036	0.00450

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00328	0.00304	0.00580
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00333	0.00310	0.00586
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00252	0.00249	0.00699
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00252	0.00255	0.00704

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__tnbufi_1	8.30280
sky130_osu_sc_12T_ms__tnbufi_l	8.30280

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_12T_ms__tnbufi_1	0.00289	0.00426	0.44457
sky130_osu_sc_12T_ms__tnbufi_l	0.00213	0.00324	0.30906

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00924	0.01108
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.12605	0.15125

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (FR)	0.06521	1.01283	11.58000
	OE->Y (RR)	0.03087	0.29610	4.44532
	OE->Y (FR)	0.07631	1.03184	11.55770
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.07224	1.04634	10.77220
	OE->Y (RR)	0.03358	0.29585	4.44509
	OE->Y (FR)	0.08142	1.08368	10.99340

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__tnbufi_1	A->Y (RF)	0.03701	0.62415	7.55604
	OE->Y (RF)	0.03050	0.29608	4.44529
	OE->Y (FF)	0.07370	0.61139	4.83679
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.04029	0.65283	7.28762
	OE->Y (RF)	0.03313	0.29585	4.44512
	OE->Y (FF)	0.07942	0.61679	4.34652

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00284	0.00277	0.00306
	OE	0.00000	0.00000	0.00000
	OE	0.00667	0.00662	0.00964
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00212	0.00210	0.00286
	OE	0.00000	0.00000	0.00000
	OE	0.00507	0.00514	0.00992

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00047	-0.00035
	OE	0.00000	0.00000	0.00000
	OE	0.00583	0.00579	0.00864
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00033	-0.00034	-0.00023
	OE	0.00000	0.00000	0.00000
	OE	0.00444	0.00457	0.00907

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00105	-0.00107	-0.00106
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00094	-0.00094	-0.00094
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00072	-0.00073	-0.00073
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00064	-0.00065	-0.00064

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00105	0.00107	0.00106
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00097	0.00098	0.00095
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00072	0.00073	0.00073
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00067	0.00067	0.00066

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00161	-0.00214	0.00053
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00161	-0.00211	0.00056
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00109	-0.00147	0.00275
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00113	-0.00149	0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00502	0.00496	0.00797
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00493	0.00492	0.00790
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00386	0.00400	0.00866
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00381	0.00395	0.00861

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__xnor2_1	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_1	0.00580	0.00492	0.46294

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_1	0.00000	0.01958	0.03276

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (RR)	B	0.13387	0.96407	7.79250
	A->Y (FR)	!B	0.08662	1.04427	11.78590
	B->Y (RR)	A	0.11033	0.93927	7.74983
	B->Y (FR)	!A	0.10458	1.06695	11.76170

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xnor2_l	A->Y (FF)	B	0.11998	0.70632	5.26738
	A->Y (RF)	!B	0.05194	0.62982	7.38466
	B->Y (FF)	A	0.10666	0.69283	5.25548
	B->Y (RF)	!A	0.06151	0.64265	7.39717

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00279	0.00235	0.00470
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00695	0.00667	0.00981
	B	A	0.00000	0.00000	0.00000
	B	A	0.00136	0.00109	0.00366
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00724	0.00705	0.00992

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00814	0.00779	0.01038
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00186	0.00145	0.00393
	B	A	0.00000	0.00000	0.00000
	B	A	0.00731	0.00726	0.01004
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00247	0.00202	0.00451

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

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_ms__xor2_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xor2_l	0.00583	0.00496	0.43390

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.01958	0.03310

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (RR)	!B	0.14078	0.96893	7.68192
	A->Y (FR)	B	0.10706	1.07185	11.66220
	B->Y (RR)	!A	0.11645	0.95299	7.67158
	B->Y (FR)	A	0.11663	1.08423	11.66870

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_12T_ms__xor2_l	A->Y (FF)	!B	0.11798	0.69343	5.06405
	A->Y (RF)	B	0.05260	0.64248	7.48949
	B->Y (FF)	!A	0.11081	0.68632	5.04612
	B->Y (RF)	A	0.05921	0.63011	7.15210

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00796	0.00772	0.01056
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00181	0.00110	0.00350
	B	A	0.00000	0.00000	0.00000
	B	A	0.00805	0.00787	0.01072
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00130	0.00099	0.00352

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_12T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00164	0.00113	0.00357
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00846	0.00828	0.01090
	B	A	0.00000	0.00000	0.00000
	B	A	0.00165	0.00117	0.00362
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00741	0.00741	0.01016

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P50_25C.ccs
Cell Library: Process , Voltage 1.50,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_12T_ms__ant	4.39560
sky130_osu_sc_12T_ms__tiehi	4.39560
sky130_osu_sc_12T_ms__tielo	4.39560

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_12T_ms__ant	0.22368
sky130_osu_sc_12T_ms__tiehi	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__ant	0.00000	84580.80000	169162.00000
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	-0.00125	0.01666	0.25638

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	1.47274	1.39892	0.32229