sky130_osu_sc_12T_ms_tt_1P20_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_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.01010	0.01019	0.00793	0.46543	0.19456	0.43119
sky130_osu_sc_12T_ms__addf_l	0.01011	0.01019	0.00794	0.34710	0.19462	0.43119

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.01120	0.01357
sky130_osu_sc_12T_ms__addf_l	0.00000	0.03139	0.05400

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)	0.34274	2.57601	25.09280
	B->CO (RR)	0.33116	2.50503	24.51040
	CI->CO (RR)	0.32416	2.56216	25.20200
	CON->CO (FR)	0.06371	1.12867	12.69020
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.32769	2.36271	21.05960
	B->CO (RR)	0.31705	2.30625	20.69050
	CI->CO (RR)	0.30942	2.34884	21.18420
	CON->CO (FR)	0.06859	1.14686	12.00000

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)	0.67131	4.17016	38.91130
	B->CO (FF)	0.61936	4.04333	37.95810
	CI->CO (FF)	0.60377	4.06474	38.57260
	CON->CO (RF)	0.03823	0.74541	8.74662
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.65167	3.77463	31.77390
	B->CO (FF)	0.60166	3.66346	31.04870
	CI->CO (FF)	0.58475	3.66872	31.44870
	CON->CO (RF)	0.04210	0.78161	8.68935

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)	0.46222	1.80333	12.96220
	B->CON (FR)	0.41374	1.71789	12.72190
	CI->CON (FR)	0.39517	1.69539	12.71170
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.44225	1.78304	12.96440
	B->CON (FR)	0.39483	1.69842	12.71580
	CI->CON (FR)	0.37518	1.67517	12.69370

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)	0.17929	0.89598	7.68302
	B->CON (RF)	0.17190	0.87848	7.72351
	CI->CON (RF)	0.16092	0.88389	7.85799
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.17353	0.89024	7.67774
	B->CON (RF)	0.16635	0.87307	7.71841
	CI->CON (RF)	0.15516	0.87809	7.85273

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)	0.92677	4.19312	32.71280
	B->S (-R)	0.91985	4.14418	32.35040
	CI->S (-R)	0.85401	4.07666	32.34360
	CON->S (RR)	0.19093	1.21481	9.62866
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.89263	4.16682	32.70040
	B->S (-R)	0.88651	4.11724	32.32810
	CI->S (-R)	0.82048	4.05004	32.31710
	CON->S (RR)	0.19100	1.21486	9.62831

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)	0.64215	2.44878	17.97560
	B->S (-F)	0.66308	2.36948	17.53850
	CI->S (-F)	0.62188	2.42625	18.07800
	CON->S (FF)	0.28068	1.08667	7.46525
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.62876	2.43681	17.96680
	B->S (-F)	0.65023	2.35932	17.53060
	CI->S (-F)	0.60897	2.41569	18.07050
	CON->S (FF)	0.28069	1.08665	7.46530

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	0.00131	0.00126	0.00123
	B	0.00149	0.00148	0.00148
	CI	0.00151	0.00153	0.00154
sky130_osu_sc_12T_ms__addf_l	A	0.00119	0.00114	0.00111
	B	0.00137	0.00136	0.00135
	CI	0.00139	0.00141	0.00140

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00387	0.00386	0.00390
	B	0.00380	0.00383	0.00386
	CI	0.00335	0.00342	0.00345
sky130_osu_sc_12T_ms__addf_l	A	0.00377	0.00376	0.00376
	B	0.00371	0.00373	0.00374
	CI	0.00325	0.00332	0.00333

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00386	0.00384	0.00382
	B	0.00380	0.00382	0.00375
	CI	0.00335	0.00340	0.00339
sky130_osu_sc_12T_ms__addf_l	A	0.00377	0.00375	0.00372
	B	0.00371	0.00372	0.00367
	CI	0.00325	0.00331	0.00330

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00129	0.00124	0.00118
	B	0.00147	0.00146	0.00140
	CI	0.00150	0.00152	0.00148
sky130_osu_sc_12T_ms__addf_l	A	0.00117	0.00112	0.00106
	B	0.00135	0.00134	0.00128
	CI	0.00139	0.00140	0.00136

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00387	0.00386	0.00389
	B	0.00381	0.00383	0.00385
	CI	0.00335	0.00342	0.00345
sky130_osu_sc_12T_ms__addf_l	A	0.00378	0.00376	0.00379
	B	0.00371	0.00374	0.00375
	CI	0.00325	0.00332	0.00335

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00769	0.00771	0.00767
	B	0.00719	0.00706	0.00702
	CI	0.00637	0.00636	0.00632
sky130_osu_sc_12T_ms__addf_l	A	0.00769	0.00771	0.00767
	B	0.00719	0.00706	0.00702
	CI	0.00637	0.00637	0.00632

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00489	0.00523	0.45749	0.46821	0.46342
sky130_osu_sc_12T_ms__addh_l	0.00492	0.00523	0.34835	0.46928	0.35260

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.01282	0.01348
sky130_osu_sc_12T_ms__addh_l	0.00000	0.05321	0.05388

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)	0.24034	1.24748	9.67223
	B->CO (RR)	0.24548	1.25169	9.89344
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.22735	1.26609	9.23077
	B->CO (RR)	0.23256	1.27129	9.48857

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)	0.22441	0.99739	7.57110
	B->CO (FF)	0.23286	1.01381	7.66203
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.21738	1.02937	7.52896
	B->CO (FF)	0.22592	1.04500	7.63314

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)	0.33350	1.31789	9.74983
	B->CON (RR)	0.33843	1.32071	9.97531
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.31129	1.29395	9.64860
	B->CON (RR)	0.31620	1.29727	9.90199

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)	0.27686	1.03615	7.65221
	B->CON (FF)	0.27807	1.04563	7.74811
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.25723	1.01211	7.51592
	B->CON (FF)	0.25862	1.02097	7.60724

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)	0.40070	2.12801	18.14550
	B->S (FR)	0.40202	2.13508	18.26580
	CON->S (FR)	0.06536	1.13524	12.77220
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.37611	2.01973	15.86930
	B->S (FR)	0.37742	2.02825	15.96930
	CON->S (FR)	0.06869	1.15264	12.12110

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)	0.45420	2.33686	19.46940
	B->S (RF)	0.45904	2.34030	19.68400
	CON->S (RF)	0.03752	0.74468	8.75158
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.43199	2.17408	16.40080
	B->S (RF)	0.43705	2.17872	16.62220
	CON->S (RF)	0.04119	0.78476	8.76302

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	0.00195	0.00187	0.00182
	B	0.00000	0.00000	0.00000
	B	0.00183	0.00177	0.00169
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00173	0.00164	0.00160
	B	0.00000	0.00000	0.00000
	B	0.00161	0.00153	0.00148

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	0.00272	0.00264	0.00255
	B	0.00000	0.00000	0.00000
	B	0.00282	0.00282	0.00276
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00249	0.00241	0.00236
	B	0.00000	0.00000	0.00000
	B	0.00259	0.00258	0.00254

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	0.00195	0.00187	0.00182
	B	0.00000	0.00000	0.00000
	B	0.00183	0.00177	0.00191
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00173	0.00164	0.00159
	B	0.00000	0.00000	0.00000
	B	0.00161	0.00153	0.00146

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	0.00272	0.00264	0.00258
	B	0.00000	0.00000	0.00000
	B	0.00282	0.00281	0.00276
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00249	0.00240	0.00233
	B	0.00000	0.00000	0.00000
	B	0.00259	0.00258	0.00251

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	0.00272	0.00265	0.00261
	B	0.00000	0.00000	0.00000
	B	0.00282	0.00282	0.00277
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00249	0.00241	0.00236
	B	0.00000	0.00000	0.00000
	B	0.00259	0.00258	0.00256

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	0.00195	0.00187	0.00183
	B	0.00000	0.00000	0.00000
	B	0.00183	0.00177	0.00170
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00173	0.00164	0.00159
	B	0.00000	0.00000	0.00000
	B	0.00161	0.00153	0.00149

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)	0.19507	0.18411	0.04477
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.19509	0.18413	0.04479

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)	0.19498	0.18350	0.04165
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.19500	0.18352	0.04167

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00266	0.00275	0.46006
sky130_osu_sc_12T_ms__and2_2	0.00266	0.00275	0.91206
sky130_osu_sc_12T_ms__and2_4	0.00266	0.00276	1.80382
sky130_osu_sc_12T_ms__and2_6	0.00269	0.00275	2.70118
sky130_osu_sc_12T_ms__and2_8	0.00266	0.00276	3.49411
sky130_osu_sc_12T_ms__and2_l	0.00204	0.00211	0.35008

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.00559	0.00890
sky130_osu_sc_12T_ms__and2_2	0.00000	0.00891	0.00904
sky130_osu_sc_12T_ms__and2_4	0.00000	0.01555	0.01766
sky130_osu_sc_12T_ms__and2_6	0.00000	0.02219	0.02642
sky130_osu_sc_12T_ms__and2_8	0.00000	0.02883	0.03518
sky130_osu_sc_12T_ms__and2_l	0.00000	0.05609	0.08972

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)	0.18248	1.15925	9.24700
	B->Y (RR)	0.19202	1.17405	9.52429
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.20625	1.05876	9.51212
	B->Y (RR)	0.21575	1.06663	9.75433
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.28482	1.06569	10.10160
	B->Y (RR)	0.29448	1.06943	10.32580
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.36519	1.11939	10.61330
	B->Y (RR)	0.37427	1.12493	10.74910
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.44148	1.18541	10.80270
	B->Y (RR)	0.45103	1.19322	10.93800
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.18185	1.19127	8.88341
	B->Y (RR)	0.19087	1.20532	9.14573

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)	0.17091	0.90673	6.92855
	B->Y (FF)	0.17824	0.92289	7.05384
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.20666	0.89498	7.31695
	B->Y (FF)	0.21264	0.90658	7.41743
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.29827	0.96750	7.99151
	B->Y (FF)	0.30095	0.96892	8.04895
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.39345	1.05973	8.47283
	B->Y (FF)	0.39162	1.06127	8.51892
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.48250	1.15473	8.74146
	B->Y (FF)	0.47718	1.14887	8.77047
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.16463	0.90368	6.35667
	B->Y (FF)	0.17638	0.92600	6.46678

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	0.00141	0.00125	0.00128
	B	0.00000	0.00000	0.00000
	B	0.00144	0.00128	0.00124
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00253	0.00248	0.00251
	B	0.00000	0.00000	0.00000
	B	0.00256	0.00252	0.00247
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00513	0.00526	0.00532
	B	0.00000	0.00000	0.00000
	B	0.00515	0.00535	0.00536
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00771	0.00800	0.00827
	B	0.00000	0.00000	0.00000
	B	0.00775	0.00811	0.00836
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01027	0.01071	0.01119
	B	0.00000	0.00000	0.00000
	B	0.01030	0.01085	0.01118
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00109	0.00098	0.00105
	B	0.00000	0.00000	0.00000
	B	0.00111	0.00101	0.00099

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	0.00337	0.00328	0.00332
	B	0.00000	0.00000	0.00000
	B	0.00380	0.00370	0.00373
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00422	0.00430	0.00435
	B	0.00000	0.00000	0.00000
	B	0.00466	0.00471	0.00473
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00632	0.00676	0.00684
	B	0.00000	0.00000	0.00000
	B	0.00677	0.00716	0.00721
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00850	0.00927	0.00944
	B	0.00000	0.00000	0.00000
	B	0.00894	0.00965	0.00977
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01055	0.01163	0.01191
	B	0.00000	0.00000	0.00000
	B	0.01098	0.01198	0.01222
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00257	0.00249	0.00265
	B	0.00000	0.00000	0.00000
	B	0.00287	0.00279	0.00293

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)	-0.00109	-0.00110	-0.00110
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00109	-0.00110	-0.00110
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00109	-0.00109	-0.00110
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00110	-0.00110	-0.00111
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00108	-0.00109	-0.00110
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00077	-0.00077	-0.00078

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)	0.00110	0.00111	0.00111
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00110	0.00111	0.00111
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00111	0.00113	0.00111
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00112	0.00114	0.00112
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00111	0.00112	0.00111
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00078	0.00079	0.00078

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)	-0.00103	-0.00104	-0.00103
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00103	-0.00104	-0.00103
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00103	-0.00104	-0.00103
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00103	-0.00103	-0.00103
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00103	-0.00103	-0.00103
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00074	-0.00074	-0.00074

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)	0.00104	0.00105	0.00104
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00104	0.00105	0.00104
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00104	0.00105	0.00104
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00104	0.00104	0.00104
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00104	0.00104	0.00104
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00074	0.00075	0.00074

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00239	0.00259	0.00256	0.19224

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00238	0.00483

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)	0.23627	1.60088	12.88020
	A1->Y (FR)	0.19862	1.50042	12.45130
	B0->Y (FR)	0.18591	1.50943	12.63970

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)	0.08955	0.79412	7.49342
	A1->Y (RF)	0.08240	0.78496	7.59619
	B0->Y (RF)	0.04953	0.68054	7.05940

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	0.00264	0.00261	0.00253
	A1	0.00000	0.00000	0.00000
	A1	0.00225	0.00221	0.00218
	B0	0.00223	0.00216	0.00216

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	0.00059	0.00052	0.00046
	A1	0.00000	0.00000	0.00000
	A1	0.00059	0.00051	0.00046
	B0	-0.00016	-0.00017	-0.00021

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)	-0.00082	-0.00087	-0.00086
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00088	-0.00089	-0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00089	-0.00089	-0.00089

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)	0.00086	0.00088	0.00086
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00088	0.00090	0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00089	0.00090	0.00089

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)	-0.00082	-0.00087	-0.00087
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00089	-0.00089	-0.00089
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00098	-0.00099	-0.00100

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)	0.00086	0.00087	0.00087
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00089	0.00090	0.00089
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00100	0.00100	0.00100

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)	-0.00049	-0.00050	-0.00049

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)	0.00057	0.00057	0.00051

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00239	0.00259	0.00272	0.00252	0.19275

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.00272	0.00876

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)	0.30044	1.67897	12.98670
	A1->Y (FR)	0.27073	1.64113	12.94350
	B0->Y (FR)	0.19637	1.51353	12.66810
	B1->Y (FR)	0.22651	1.55317	12.73790

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)	0.11264	0.82153	7.53070
	A1->Y (RF)	0.10532	0.81282	7.63437
	B0->Y (RF)	0.06867	0.76850	7.57833
	B1->Y (RF)	0.07624	0.77480	7.47591

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	0.00327	0.00323	0.00303
	A1	0.00288	0.00282	0.00273
	B0	0.00238	0.00227	0.00228
	B1	0.00278	0.00267	0.00270

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00114	0.00107	0.00100
	A1	0.00114	0.00107	0.00099
	B0	-0.00006	-0.00007	-0.00011
	B1	-0.00006	-0.00007	-0.00011

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)	-0.00083	-0.00087	-0.00086
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00088	-0.00089	-0.00089
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00088	-0.00089	-0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00089	-0.00089	-0.00089

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)	0.00086	0.00087	0.00086
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00088	0.00090	0.00089
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00089	0.00090	0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00089	0.00090	0.00089

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)	-0.00083	-0.00086	-0.00086
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00089	-0.00089	-0.00089
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00098	-0.00099	-0.00099
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00098	-0.00099	-0.00099

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)	0.00086	0.00086	0.00086
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00089	0.00091	0.00089
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00099	0.00100	0.00100
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00099	0.00100	0.00100

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)	-0.00049	-0.00049	-0.00049
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00049	-0.00049	-0.00049
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00103	-0.00103	-0.00105
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00103	-0.00103	-0.00105

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)	0.00060	0.00060	0.00052
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00049	0.00049	0.00049
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00104	0.00105	0.00105
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00104	0.00105	0.00105

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)	-0.00050	-0.00050	-0.00050
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00050	-0.00050	-0.00050
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00094	-0.00095	-0.00094
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00094	-0.00094	-0.00094

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)	0.00061	0.00061	0.00053
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00050	0.00050	0.00050
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00095	0.00096	0.00094
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00095	0.00096	0.00094

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00277	0.44174
sky130_osu_sc_12T_ms__buf_2	0.00277	0.90260
sky130_osu_sc_12T_ms__buf_4	0.00276	1.77809
sky130_osu_sc_12T_ms__buf_6	0.00082	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00277	3.48472
sky130_osu_sc_12T_ms__buf_l	0.00209	0.35089

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00452	0.00452
sky130_osu_sc_12T_ms__buf_2	0.00000	0.00678	0.00890
sky130_osu_sc_12T_ms__buf_4	0.00000	0.01130	0.01766
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.02034	0.03518
sky130_osu_sc_12T_ms__buf_l	0.00000	0.04490	0.04490

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)**	0.12929	1.11633	9.18394
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.13393	0.98777	9.44190
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.17838	0.95195	9.86539
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.26930	0.99393	10.49610
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.12941	1.13303	8.77277

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)**	0.16342	0.88764	6.71285
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.19864	0.88330	7.23526
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.29145	0.95620	7.90486
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.47563	1.14593	8.71345
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.16044	0.89838	6.31268

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	0.00136	0.00114	0.00116
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00248	0.00237	0.00239
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00509	0.00517	0.00516
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01024	0.01070	0.01099
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00106	0.00091	0.00095

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	0.00334	0.00321	0.00326
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00417	0.00417	0.00421
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00629	0.00663	0.00668
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01053	0.01148	0.01170
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00258	0.00248	0.00263

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
	-0.00028	-0.00029	-0.00028

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
	0.00028	0.00029	0.00028

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00250	0.00252	0.00824	0.45527	0.45884
sky130_osu_sc_12T_ms__dffnr_l	0.00250	0.00252	0.00824	0.35226	0.35233

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.03800	0.07551
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.07837	0.11588

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)	1.04508	2.79264	18.24870
	QN->Q (FR)	0.07000	1.19621	13.35830
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	1.01269	2.84703	17.89170
	QN->Q (FR)	0.07182	1.20116	12.56180

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)	0.65724	2.56380	20.40780
	QN->Q (RF)	0.04116	0.78160	9.12689
	RN->Q (FF)	0.56426	2.53061	20.75790
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.65382	2.72409	20.45210
	QN->Q (RF)	0.04409	0.81754	9.08284
	RN->Q (FF)	0.56137	2.68820	20.79280

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)	0.56130	1.58491	10.89400
	RN->QN (FR)	0.46758	1.55046	11.24190
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.54753	1.61339	10.61960
	RN->QN (FR)	0.45420	1.57858	10.96240

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)**	0.91566	1.73662	8.07063
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.88621	1.73732	8.11805

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)	-0.18978	-0.51033	-4.54767
	setup	CK (F)	0.44515	0.55513	4.62334
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18931	-0.51094	-4.54783
	setup	CK (F)	0.44753	0.55542	4.62394

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)	-0.23866	-0.27999	-1.56025
	setup	CK (F)	0.48362	0.49417	2.21949
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.23797	-0.28258	-1.56270
	setup	CK (F)	0.48449	0.49425	2.23104

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)	-0.18978	-0.51033	-4.54767
	setup	CK (F)	0.44515	0.55513	4.62334
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.18931	-0.51094	-4.54783
	setup	CK (F)	0.44753	0.55542	4.62394

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)	-0.23866	-0.27999	-1.56025
	setup	CK (F)	0.48362	0.49417	2.21949
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.23797	-0.28258	-1.56270
	setup	CK (F)	0.48449	0.49425	2.23104

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)	0.36935	0.36578	0.52341
	removal	CK (F)	-0.19749	-0.18881	-0.43531
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.37485	0.37118	0.51681
	removal	CK (F)	-0.19846	-0.18746	-0.43540

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)	0.36935	0.36578	0.52341
	removal	CK (F)	-0.19749	-0.18881	-0.43531
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.37485	0.37118	0.51681
	removal	CK (F)	-0.19846	-0.18746	-0.43540

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 ()	0.35905	0.68576	13.33370
	min_pulse_width	RN ()	0.36165	0.68576	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.35169	0.68140	13.33370
	min_pulse_width	RN ()	0.34911	0.68140	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 ()	0.44545	0.52856	13.33370
	min_pulse_width	CK ()	0.55257	0.55040	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.44941	0.52856	13.33370
	min_pulse_width	CK ()	0.55257	0.55040	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 ()	0.42729	0.67048	13.33370
	min_pulse_width	CK ()	0.34663	0.70323	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.41583	0.66830	13.33370
	min_pulse_width	CK ()	0.34029	0.70105	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	0.00641	0.00627	0.00464
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00607	0.00594	0.00489

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	0.00629	0.00605	0.00508
	RN	-0.00047	-0.01578	-0.16390
	RN	0.00818	0.00801	0.00685
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00594	0.00572	0.00515
	RN	-0.00047	-0.01353	-0.12682
	RN	0.00783	0.00768	0.00694

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	0.00629	0.00605	0.00507
	RN	-0.00047	-0.01586	-0.16518
	RN	0.00818	0.00801	0.00683
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00594	0.00572	0.00516
	RN	-0.00047	-0.01353	-0.12684
	RN	0.00783	0.00768	0.00692

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	0.00639	0.00625	0.00459
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00605	0.00593	0.00488

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)	0.00401	0.00386	0.00374
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00132	0.00119	0.00111
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00090	-0.00099	-0.00099
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)	0.00401	0.00386	0.00374
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00132	0.00119	0.00111
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00090	-0.00099	-0.00099

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)	0.00601	0.00593	0.00579
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00322	0.00314	0.00307
	!CK	0.00000	0.00000	0.00000
	!CK	0.00099	0.00099	0.00099
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)	0.00601	0.00593	0.00579
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00322	0.00314	0.00307
	!CK	0.00000	0.00000	0.00000
	!CK	0.00099	0.00099	0.00099

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)	0.00417	0.00389	0.00380
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00135	0.00117	0.00114
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00417	0.00389	0.00380
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00135	0.00117	0.00114

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)	0.00621	0.00600	0.00585
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00331	0.00318	0.00319
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00621	0.00600	0.00585
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00331	0.00318	0.00319

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)	-0.00006	-0.00032	-0.00041
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00458	0.00401	0.00385
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00138	0.00091	0.00083
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00518	0.00476	0.00451
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00005	-0.00032	-0.00041
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00006	-0.00032	-0.00041
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00458	0.00401	0.00385
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00138	0.00091	0.00083
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00518	0.00476	0.00451
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00005	-0.00032	-0.00041

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)	0.00535	0.00512	0.00508
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00673	0.00638	0.00641
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00553	0.00531	0.00531
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00535	0.00512	0.00508
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00673	0.00638	0.00641
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00553	0.00531	0.00531

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00250	0.00252	0.00820	0.45287	0.46039
sky130_osu_sc_12T_ms__dffr_l	0.00250	0.00252	0.00819	0.34714	0.35242

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.03800	0.07561
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.07837	0.11599

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)	0.84406	2.47557	16.34040
	QN->Q (FR)	0.07000	1.19396	13.32130
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.81117	2.52076	15.86660
	QN->Q (FR)	0.07182	1.19454	12.45870

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)	0.80804	2.68233	19.53030
	QN->Q (RF)	0.04116	0.78049	9.10819
	RN->Q (FF)	0.56548	2.52576	20.67610
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.80451	2.83285	19.43540
	QN->Q (RF)	0.04409	0.81416	9.03029
	RN->Q (FF)	0.56223	2.67582	20.55610

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)	0.71209	1.71054	10.12180
	RN->QN (FR)	0.46838	1.55369	11.26720
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.69821	1.73765	9.83982
	RN->QN (FR)	0.45493	1.58039	10.96700

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)**	0.71444	1.42451	6.25984
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.68486	1.42416	6.29986

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)	-0.12666	-0.15883	-0.96479
	setup	CK (R)	0.64518	0.63527	1.86477
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12354	-0.15752	-0.96294
	setup	CK (R)	0.64486	0.63885	1.87511

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)	-0.34460	-0.71650	-7.14103
	setup	CK (R)	0.40768	0.75176	7.21976
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.34226	-0.71498	-7.14128
	setup	CK (R)	0.40767	0.75178	7.21974

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)	-0.12666	-0.15883	-0.96479
	setup	CK (R)	0.64518	0.63527	1.86477
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.12354	-0.15752	-0.96294
	setup	CK (R)	0.64486	0.63885	1.87511

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)	-0.34460	-0.71650	-7.14103
	setup	CK (R)	0.40768	0.75176	7.21976
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.34226	-0.71498	-7.14128
	setup	CK (R)	0.40767	0.75178	7.21974

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)	0.56987	0.56543	1.53017
	removal	CK (R)	-0.07300	-0.08494	-0.06162
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.57178	0.56899	1.54474
	removal	CK (R)	-0.07300	-0.08494	-0.06162

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)	0.56987	0.56543	1.53017
	removal	CK (R)	-0.07300	-0.08494	-0.06162
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.57178	0.56899	1.54474
	removal	CK (R)	-0.07300	-0.08494	-0.06162

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 ()	0.36165	0.68576	13.33370
	min_pulse_width	RN ()	0.36165	0.68576	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.34911	0.68140	13.33370
	min_pulse_width	RN ()	0.35169	0.68140	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 ()	0.35070	0.53511	13.33370
	min_pulse_width	CK ()	0.47711	0.52856	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.33068	0.52856	13.33370
	min_pulse_width	CK ()	0.46920	0.52856	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 ()	0.84057	0.86698	13.33370
	min_pulse_width	CK ()	0.33886	0.65083	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.84480	0.87135	13.33370
	min_pulse_width	CK ()	0.33886	0.65083	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	0.00347	0.00314	0.00156
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00313	0.00282	0.00185

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	0.00379	0.00357	0.00250
	RN	-0.00047	-0.01573	-0.16303
	RN	0.00848	0.00832	0.00717
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00344	0.00324	0.00258
	RN	-0.00047	-0.01341	-0.12497
	RN	0.00813	0.00799	0.00722

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	0.00379	0.00357	0.00249
	RN	-0.00047	-0.01589	-0.16574
	RN	0.00848	0.00832	0.00713
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00344	0.00324	0.00258
	RN	-0.00047	-0.01353	-0.12687
	RN	0.00813	0.00799	0.00721

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	0.00345	0.00312	0.00147
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00312	0.00280	0.00179

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	-0.00078	-0.00088	-0.00088
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00404	0.00389	0.00377
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00161	0.00148	0.00140
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00078	-0.00088	-0.00088
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00404	0.00389	0.00377
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00161	0.00148	0.00140

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	0.00088	0.00088	0.00088
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00598	0.00590	0.00576
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00293	0.00285	0.00279
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00088	0.00088	0.00088
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00598	0.00590	0.00576
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00293	0.00285	0.00279

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)	0.00135	0.00117	0.00114
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00394	0.00366	0.00357
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)	0.00135	0.00117	0.00114
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00394	0.00366	0.00357

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)	0.00331	0.00318	0.00319
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00643	0.00622	0.00608
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)	0.00331	0.00318	0.00319
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00643	0.00622	0.00608

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)	-0.00015	-0.00039	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00205	0.00169	0.00142
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00018	-0.00044	-0.00053
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00015	-0.00039	-0.00050
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00205	0.00169	0.00142
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00018	-0.00044	-0.00053

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)	0.00527	0.00505	0.00501
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01026	0.00995	0.00967
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00767	0.00749	0.00733
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01016	0.00979	0.00971
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00550	0.00528	0.00529
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00527	0.00505	0.00501
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01027	0.00995	0.00967
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00767	0.00749	0.00733
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01016	0.00979	0.00971
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00550	0.00528	0.00529

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00247	0.00254	0.00595	0.00834	0.47251	0.47155
sky130_osu_sc_12T_ms__dffsr_l	0.00247	0.00254	0.00595	0.00834	0.34480	0.35260

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.01733	0.02343
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.05771	0.06381

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)	0.90462	2.56511	17.00170
	QN->Q (FR)	0.06707	1.17707	13.27450
	RN->Q (RR)	0.73763	2.41747	17.06500
	SN->Q (FR)	0.71115	2.44712	18.90460
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.88462	2.60137	16.03170
	QN->Q (FR)	0.07167	1.19087	12.40760
	RN->Q (RR)	0.71770	2.45442	16.08810
	SN->Q (FR)	0.68780	2.48039	17.89110

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)	0.94512	2.84491	20.12010
	QN->Q (RF)	0.04087	0.78790	9.25963
	RN->Q (FF)	0.60110	2.57680	21.23980
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.94117	2.97083	19.48150
	QN->Q (RF)	0.04387	0.81192	9.00220
	RN->Q (FF)	0.60047	2.70518	20.58570

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)	0.84669	1.85098	10.28620
	RN->QN (FR)	0.50532	1.58371	11.41070
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.83142	1.88173	10.00270
	RN->QN (FR)	0.49343	1.61848	11.11260

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)	0.78179	1.50580	6.58786
	RN->QN (RF)	0.61479	1.36109	6.64983
	SN->QN (FF)	0.58819	1.39113	8.47348
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.76206	1.51263	6.55634
	RN->QN (RF)	0.59471	1.36840	6.61921
	SN->QN (FF)	0.56848	1.39870	8.40289

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)	-0.15640	-0.18367	-1.12244
	setup	CK (R)	0.67547	0.66336	1.83131
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15402	-0.18363	-1.12236
	setup	CK (R)	0.67710	0.66512	1.83922

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)	-0.40630	-0.76589	-7.44706
	setup	CK (R)	0.49309	0.79905	7.50765
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.40423	-0.76526	-7.44532
	setup	CK (R)	0.49341	0.79905	7.50766

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)	-0.15640	-0.18367	-1.12244
	setup	CK (R)	0.67547	0.66336	1.83131
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.15402	-0.18363	-1.12236
	setup	CK (R)	0.67710	0.66512	1.83922

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)	-0.40630	-0.76589	-7.44706
	setup	CK (R)	0.49309	0.79905	7.50765
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.40423	-0.76526	-7.44532
	setup	CK (R)	0.49341	0.79905	7.50766

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)	0.54963	0.54270	1.45392
	removal	CK (R)	-0.06797	-0.08008	-0.15048
	hold	SN (R)	-0.57410	-0.84767	-6.54872
	setup	SN (R)	0.60710	0.91181	8.28410
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.54980	0.54527	1.46462
	removal	CK (R)	-0.06797	-0.08008	-0.15048
	hold	SN (R)	-0.54583	-0.81910	-6.43805
	setup	SN (R)	0.60370	0.88624	8.18393

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)	0.54963	0.54270	1.45392
	removal	CK (R)	-0.06797	-0.08008	-0.15048
	hold	SN (R)	-0.57410	-0.84767	-6.54872
	hold	SN (R)	-0.57519	-0.84961	-6.55899
	setup	SN (R)	0.60569	0.90746	8.25014
	setup	SN (R)	0.60710	0.91181	8.28410
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.54980	0.54527	1.46462
	removal	CK (R)	-0.06797	-0.08008	-0.15048
	hold	SN (R)	-0.55225	-0.81910	-6.43805
	hold	SN (R)	-0.54583	-0.82094	-6.45289
	setup	SN (R)	0.60370	0.88070	8.12422
	setup	SN (R)	0.57657	0.88624	8.18393

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 ()	0.40201	0.71196	13.33370
	min_pulse_width	RN ()	0.41279	0.71196	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.39157	0.70760	13.33370
	min_pulse_width	RN ()	0.40496	0.70760	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)	0.07950	0.10214	1.01853
	removal	CK (R)	-0.02233	-0.05676	-0.67510
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.07894	0.10230	0.96296
	removal	CK (R)	-0.02233	-0.05676	-0.67510

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)	0.07950	0.10214	1.01853
	removal	CK (R)	-0.02233	-0.05676	-0.67510
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.07894	0.10230	0.96296
	removal	CK (R)	-0.02233	-0.05676	-0.67510

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 ()	0.57057	0.89973	13.33370
	min_pulse_width	SN ()	0.57881	0.90191	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.55752	0.87353	13.33370
	min_pulse_width	SN ()	0.54889	0.87571	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 ()	0.40596	0.55913	13.33370
	min_pulse_width	CK ()	0.52339	0.54166	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.39035	0.55476	13.33370
	min_pulse_width	CK ()	0.51724	0.53948	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 ()	0.87616	0.89318	13.33370
	min_pulse_width	CK ()	0.43445	0.69886	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.87702	0.89755	13.33370
	min_pulse_width	CK ()	0.43445	0.69886	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	0.00417	0.00387	0.00226
	RN	0.00759	0.00737	0.00569
	SN	-0.00047	-0.01614	-0.17010
	SN	0.00826	0.00809	0.00640
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00386	0.00358	0.00259
	RN	0.00727	0.00707	0.00605
	SN	-0.00047	-0.01336	-0.12413
	SN	0.00794	0.00779	0.00673

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	0.00438	0.00421	0.00341
	RN	-0.00047	-0.01614	-0.17010
	RN	0.00893	0.00878	0.00789
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00405	0.00386	0.00323
	RN	-0.00047	-0.01336	-0.12413
	RN	0.00859	0.00844	0.00772

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	0.00438	0.00421	0.00341
	RN	-0.00047	-0.01612	-0.16976
	RN	0.00893	0.00878	0.00787
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00405	0.00387	0.00322
	RN	-0.00047	-0.01354	-0.12693
	RN	0.00859	0.00844	0.00768

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	0.00415	0.00385	0.00216
	RN	0.00757	0.00735	0.00561
	SN	-0.00047	-0.01612	-0.16975
	SN	0.00824	0.00807	0.00633
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00384	0.00355	0.00251
	RN	0.00725	0.00705	0.00595
	SN	-0.00047	-0.01354	-0.12693
	SN	0.00793	0.00777	0.00668

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	-0.00086	-0.00089	-0.00088
	(!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)	0.00499	0.00485	0.00475
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00173	0.00161	0.00151
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00172	0.00159	0.00151
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00174	0.00162	0.00153
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00086	-0.00089	-0.00088
	(!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)	0.00499	0.00485	0.00475
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00173	0.00161	0.00152
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00172	0.00159	0.00151
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00174	0.00162	0.00153

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	0.00089	0.00089	0.00088
	(!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)	0.00688	0.00680	0.00664
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00323	0.00317	0.00313
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00325	0.00318	0.00314
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00322	0.00315	0.00312
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00089	0.00089	0.00088
	(!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)	0.00688	0.00680	0.00664
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00323	0.00317	0.00313
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00325	0.00319	0.00314
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00322	0.00315	0.00312

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)	0.00124	0.00106	0.00096
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00469	0.00440	0.00423
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)	0.00124	0.00106	0.00096
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00469	0.00440	0.00423

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)	0.00364	0.00352	0.00355
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00685	0.00662	0.00649
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)	0.00364	0.00352	0.00355
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00685	0.00662	0.00649

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)	-0.00232	-0.00234	-0.00235
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00245	-0.00255	-0.00254
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00230	-0.00235	-0.00235
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00106	0.00091	0.00076
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)	-0.00232	-0.00234	-0.00235
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00245	-0.00255	-0.00254
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00230	-0.00235	-0.00235
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00106	0.00092	0.00076

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)	0.00235	0.00236	0.00235
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00253	0.00256	0.00254
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00235	0.00236	0.00235
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00544	0.00531	0.00528
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)	0.00235	0.00236	0.00235
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00253	0.00256	0.00254
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00235	0.00236	0.00235
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00544	0.00531	0.00528

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)	-0.00018	-0.00042	-0.00053
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00244	0.00210	0.00185
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00241	0.00208	0.00183
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00012	-0.00038	-0.00047
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00138	0.00093	0.00079
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00018	-0.00042	-0.00053
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00244	0.00210	0.00185
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00241	0.00208	0.00183
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00012	-0.00038	-0.00047
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00138	0.00093	0.00080

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)	0.01136	0.01105	0.01077
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00537	0.00515	0.00511
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00776	0.00760	0.00743
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00779	0.00761	0.00743
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01111	0.01072	0.01058
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00550	0.00528	0.00529
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00710	0.00673	0.00676
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01136	0.01105	0.01077
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00537	0.00515	0.00511
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00776	0.00760	0.00743
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00779	0.00761	0.00743
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01111	0.01072	0.01058
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00550	0.00528	0.00529
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00710	0.00673	0.00676

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00248	0.00498	0.00814	0.45897	0.46013
sky130_osu_sc_12T_ms__dffs_l	0.00248	0.00499	0.00814	0.34808	0.35452

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.07134	0.18865
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.11171	0.22903

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)	0.55562	2.16141	16.22500
	QN->Q (FR)	0.07009	1.19761	13.38980
	SN->Q (FR)	0.43767	2.11979	17.38530
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.54395	2.22715	15.64420
	QN->Q (FR)	0.07181	1.19365	12.45770
	SN->Q (FR)	0.42333	2.18321	16.74160

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)	0.90184	2.79213	19.82090
	QN->Q (RF)	0.04097	0.77719	9.14032
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.88835	2.92025	19.54490
	QN->Q (RF)	0.04394	0.81280	9.02827

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)	0.80138	1.80657	10.20320
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.77797	1.82515	9.95751

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)	0.44662	1.11347	5.99111
	SN->QN (FF)	0.32585	1.07392	7.13670
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.43486	1.13821	6.07368
	SN->QN (FF)	0.31251	1.09636	7.17045

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)	-0.10172	-0.13328	-0.87490
	setup	CK (R)	0.38833	0.38092	1.69620
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10148	-0.13558	-0.87230
	setup	CK (R)	0.38955	0.38233	1.70880

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)	-0.36114	-0.72981	-7.25451
	setup	CK (R)	0.46401	0.76919	7.32957
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.36282	-0.72854	-7.25216
	setup	CK (R)	0.46394	0.76929	7.32976

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)	-0.10172	-0.13328	-0.87490
	setup	CK (R)	0.38833	0.38092	1.69620
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.10148	-0.13558	-0.87230
	setup	CK (R)	0.38955	0.38233	1.70880

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)	-0.36114	-0.72981	-7.25451
	setup	CK (R)	0.46401	0.76919	7.32957
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.36282	-0.72854	-7.25216
	setup	CK (R)	0.46394	0.76929	7.32976

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)	0.09725	0.12309	0.93447
	removal	CK (R)	-0.03317	-0.06691	-0.62581
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.09532	0.12300	0.90305
	removal	CK (R)	-0.03317	-0.06691	-0.62581

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)	0.09725	0.12309	0.93447
	removal	CK (R)	-0.03317	-0.06691	-0.62581
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.09532	0.12300	0.90305
	removal	CK (R)	-0.03317	-0.06691	-0.62581

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 ()	0.30406	0.71633	13.33370
	min_pulse_width	SN ()	0.31219	0.71633	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.29344	0.69668	13.33370
	min_pulse_width	SN ()	0.29431	0.69886	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 ()	0.20799	0.52856	13.33370
	min_pulse_width	CK ()	0.49895	0.53075	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.20007	0.52856	13.33370
	min_pulse_width	CK ()	0.48899	0.52856	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 ()	0.58624	0.67266	13.33370
	min_pulse_width	CK ()	0.40825	0.66830	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.58624	0.67266	13.33370
	min_pulse_width	CK ()	0.41078	0.66830	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	0.00347	0.00313	0.00154
	SN	-0.00047	-0.01586	-0.16523
	SN	0.00716	0.00689	0.00535
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00313	0.00281	0.00188
	SN	-0.00047	-0.01343	-0.12531
	SN	0.00682	0.00657	0.00561

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	0.00379	0.00357	0.00252
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00344	0.00325	0.00261

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	0.00379	0.00357	0.00252
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00344	0.00325	0.00260

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	0.00345	0.00311	0.00153
	SN	-0.00047	-0.01588	-0.16564
	SN	0.00714	0.00687	0.00528
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00311	0.00279	0.00175
	SN	-0.00047	-0.01358	-0.12762
	SN	0.00680	0.00655	0.00555

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	-0.00087	-0.00090	-0.00090
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00397	0.00382	0.00366
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00160	0.00147	0.00138
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00087	-0.00090	-0.00090
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00397	0.00382	0.00366
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00160	0.00147	0.00138

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	0.00090	0.00090	0.00090
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00594	0.00585	0.00575
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00296	0.00289	0.00286
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00090	0.00090	0.00090
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00595	0.00585	0.00575
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00296	0.00289	0.00286

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)	-0.00173	-0.00174	-0.00174
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00114	0.00098	0.00093
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)	-0.00173	-0.00174	-0.00174
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00114	0.00098	0.00093

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)	0.00174	0.00176	0.00175
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00386	0.00369	0.00376
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)	0.00174	0.00176	0.00175
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00386	0.00369	0.00376

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)	-0.00015	-0.00038	-0.00050
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00015	-0.00041	-0.00049
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00128	0.00083	0.00071
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00015	-0.00038	-0.00050
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00015	-0.00041	-0.00049
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00128	0.00083	0.00071

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)	0.01023	0.00992	0.00963
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00528	0.00506	0.00502
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01009	0.00965	0.00958
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00547	0.00525	0.00525
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00673	0.00634	0.00640
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01023	0.00992	0.00962
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00528	0.00506	0.00502
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01009	0.00965	0.00958
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00547	0.00525	0.00526
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00673	0.00634	0.00640

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00264	0.00796	0.43121
sky130_osu_sc_12T_ms__dff_l	0.00264	0.00794	0.33554

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.01535	0.01893
sky130_osu_sc_12T_ms__dff_l	0.00000	0.05573	0.05930

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)**	0.49078	1.47873	9.59592
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.47848	1.50580	9.33073

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)**	0.75983	1.41481	6.35118
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.74939	1.44691	6.46831

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)	-0.10927	-0.14469	-0.97473
	setup	CK (R)	0.33470	0.32761	1.68683
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.10915	-0.14486	-0.97464
	setup	CK (R)	0.33522	0.33010	1.70085

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)	-0.34440	-0.72749	-7.28031
	setup	CK (R)	0.41248	0.77343	7.36272
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.34363	-0.72404	-7.27828
	setup	CK (R)	0.41264	0.77343	7.36396

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 ()	0.20007	0.52856	13.33370
	min_pulse_width	CK ()	0.46524	0.52856	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.19611	0.52856	13.33370
	min_pulse_width	CK ()	0.45732	0.52856	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 ()**	0.52583	0.65738	13.33370
	min_pulse_width	**CK ()**	0.33901	0.66611	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.52583	0.65738	13.33370
	min_pulse_width	**CK ()**	0.33901	0.66611	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	0.00729	0.00675	0.00649
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00660	0.00604	0.00581

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	0.00774	0.00740	0.00714
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00706	0.00670	0.00645

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	-0.00078	-0.00087	-0.00087
	!CK	0.00000	0.00000	0.00000
	!CK	0.00366	0.00349	0.00333
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00078	-0.00087	-0.00087
	!CK	0.00000	0.00000	0.00000
	!CK	0.00366	0.00350	0.00333

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	0.00087	0.00087	0.00087
	!CK	0.00000	0.00000	0.00000
	!CK	0.00620	0.00608	0.00594
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00087	0.00087	0.00087
	!CK	0.00000	0.00000	0.00000
	!CK	0.00620	0.00609	0.00594

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)	-0.00017	-0.00040	-0.00051
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00015	-0.00041	-0.00049
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00017	-0.00040	-0.00051
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00015	-0.00041	-0.00049

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)	0.00526	0.00504	0.00500
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.00989	0.00959	0.00930
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01026	0.00981	0.00972
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00544	0.00521	0.00522
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00526	0.00504	0.00500
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.00989	0.00959	0.00930
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01025	0.00981	0.00972
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00544	0.00521	0.00522

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00256	0.43872
sky130_osu_sc_12T_ms__inv_10	0.02264	4.35736
sky130_osu_sc_12T_ms__inv_2	0.00472	0.90391
sky130_osu_sc_12T_ms__inv_3	0.00698	1.30315
sky130_osu_sc_12T_ms__inv_4	0.00918	1.75471
sky130_osu_sc_12T_ms__inv_6	0.01374	2.62088
sky130_osu_sc_12T_ms__inv_8	0.01819	3.52681
sky130_osu_sc_12T_ms__inv_l	0.00205	0.33341

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00226	0.00438
sky130_osu_sc_12T_ms__inv_10	0.00000	0.02260	0.04380
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00452	0.00876
sky130_osu_sc_12T_ms__inv_3	0.00000	0.00678	0.01314
sky130_osu_sc_12T_ms__inv_4	0.00000	0.00904	0.01752
sky130_osu_sc_12T_ms__inv_6	0.00000	0.01356	0.02628
sky130_osu_sc_12T_ms__inv_8	0.00000	0.01808	0.03504
sky130_osu_sc_12T_ms__inv_l	0.00000	0.02245	0.04483

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)**	0.06872	1.14950	12.72480
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.05923	0.74458	12.66790
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.04809	0.97323	12.72160
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.04929	0.89671	12.60270
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.04618	0.84846	12.56690
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.04836	0.79477	12.57030
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.05298	0.76295	12.68110
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.07261	1.15740	11.97540

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)**	0.03803	0.73261	8.54986
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.04100	0.54871	8.69029
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02950	0.66009	8.65458
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.03083	0.62807	8.64120
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02957	0.60407	8.64764
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.03262	0.57678	8.66944
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.03644	0.56185	8.72071
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.04237	0.77092	8.55319

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	0.00167	0.00164	0.00084
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.01361	0.01316	0.01225
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00285	0.00282	0.00100
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00439	0.00421	0.00392
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00558	0.00554	0.00257
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.00828	0.00824	0.00388
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01095	0.01052	0.00910
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00132	0.00130	0.00133

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	-0.00020	-0.00023	-0.00024
sky130_osu_sc_12T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.00406	-0.00416	-0.00372
sky130_osu_sc_12T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00076	-0.00079	-0.00079
sky130_osu_sc_12T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00094	-0.00101	-0.00097
sky130_osu_sc_12T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00154	-0.00161	-0.00152
sky130_osu_sc_12T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.00234	-0.00243	-0.00226
sky130_osu_sc_12T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.00317	-0.00326	-0.00299
sky130_osu_sc_12T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00015	-0.00017	-0.00018

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.23930	0.24009	0.00529	0.39946

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00457	0.00457

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)	-	0.03532	0.74018	8.64167
	A1->Y (RR)	-	0.04339	0.74296	8.65364
	S0->Y (RR)	(!A0 * A1)	0.10389	0.88757	7.90474
	S0->Y (FR)	(A0 * !A1)	0.07011	0.97477	9.34392

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)	-	0.03539	0.64398	7.57071
	A1->Y (FF)	-	0.02937	0.63825	7.55664
	S0->Y (FF)	(!A0 * A1)	0.16110	0.83310	6.45968
	S0->Y (RF)	(A0 * !A1)	0.04074	0.70041	7.56009

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	-	-0.00166	-0.00166	-0.00166
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00111	-0.00111	-0.00111
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00229	0.00212	0.00219
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00097	-0.00121	-0.00122

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	-	0.00166	0.00166	0.00166
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00111	0.00111	0.00111
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00038	0.00014	0.00014
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00443	0.00426	0.00431

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)	-0.00043	-0.00043	-0.00043

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)	0.00043	0.00043	0.00043

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)	-0.00052	-0.00051	-0.00051

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)	0.00052	0.00051	0.00051

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)	-0.00031	-0.00055	-0.00055
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00029	-0.00054	-0.00054

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)	0.00345	0.00328	0.00333
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00327	0.00311	0.00317

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00255	0.00254	0.44009
sky130_osu_sc_12T_ms__nand2_l	0.00200	0.00202	0.33277

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00227	0.00876
sky130_osu_sc_12T_ms__nand2_l	0.00000	0.02246	0.08965

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)	0.07185	1.15825	12.80440
	B->Y (FR)	0.08076	1.13343	12.45530
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.07325	1.16008	11.97920
	B->Y (FR)	0.08482	1.16953	11.97740

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)	0.06487	0.98633	10.91160
	B->Y (RF)	0.07294	0.99676	10.85920
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.07073	1.05358	10.87970
	B->Y (RF)	0.07809	1.06025	10.79230

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	0.00175	0.00173	0.00171
	B	0.00000	0.00000	0.00000
	B	0.00217	0.00213	0.00146
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00132	0.00130	0.00133
	B	0.00000	0.00000	0.00000
	B	0.00162	0.00159	0.00162

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	-0.00010	-0.00013	-0.00014
	B	0.00000	0.00000	0.00000
	B	-0.00009	-0.00011	-0.00013
sky130_osu_sc_12T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00006	-0.00008	-0.00009
	B	0.00000	0.00000	0.00000
	B	-0.00006	-0.00008	-0.00009

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)	-0.00104	-0.00105	-0.00106
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00074	-0.00075	-0.00075

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)	0.00105	0.00106	0.00106
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00075	0.00076	0.00076

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)	-0.00096	-0.00097	-0.00096
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00070	-0.00070	-0.00070

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)	0.00097	0.00098	0.00097
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00070	0.00071	0.00070

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00251	0.00278	0.20442
sky130_osu_sc_12T_ms__nor2_l	0.00192	0.00213	0.15668

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00187	0.00438
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.01568	0.04483

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)	0.17688	1.50767	12.82950
	B->Y (FR)	0.15007	1.44075	12.56020
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.17634	1.54425	12.35540
	B->Y (FR)	0.15660	1.46248	11.76230

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)	0.04632	0.62953	6.59446
	B->Y (RF)	0.04020	0.62198	6.57664
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.04902	0.65350	6.58459
	B->Y (RF)	0.04382	0.64630	6.56924

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	0.00219	0.00215	0.00194
	B	0.00000	0.00000	0.00000
	B	0.00184	0.00178	0.00177
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00160	0.00158	0.00157
	B	0.00000	0.00000	0.00000
	B	0.00139	0.00135	0.00135

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	0.00026	0.00019	0.00015
	B	0.00000	0.00000	0.00000
	B	-0.00016	-0.00017	-0.00022
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00020	0.00015	0.00013
	B	0.00000	0.00000	0.00000
	B	-0.00010	-0.00011	-0.00014

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)	-0.00079	-0.00088	-0.00088
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00051	-0.00060	-0.00061

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)	0.00087	0.00088	0.00088
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00060	0.00061	0.00061

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)	-0.00049	-0.00050	-0.00050
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00035	-0.00035	-0.00035

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)	0.00053	0.00053	0.00051
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00037	0.00038	0.00036

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00254	0.00263	0.00228	0.20676

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.01780	0.04921

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)	0.20295	1.50575	12.72080
	A1->Y (FR)	0.23775	1.58279	12.98810
	B0->Y (FR)	0.09208	0.99486	9.49969

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)	0.08643	0.81546	7.76320
	A1->Y (RF)	0.09911	0.81780	7.71256
	B0->Y (RF)	0.07019	0.80230	7.93779

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	0.00243	0.00235	0.00235
	A1	0.00000	0.00000	0.00000
	A1	0.00282	0.00278	0.00247
	B0	0.00194	0.00187	0.00188

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	0.00019	0.00017	0.00013
	A1	0.00000	0.00000	0.00000
	A1	0.00063	0.00057	0.00053
	B0	0.00080	0.00076	0.00073

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)	-0.00050	-0.00051	-0.00050
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00088	-0.00090	-0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00092	-0.00092	-0.00092

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)	0.00054	0.00054	0.00051
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00090	0.00090	0.00089
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00092	0.00093	0.00092

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)	-0.00075	-0.00085	-0.00085
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00086	-0.00089	-0.00089
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00091	-0.00091	-0.00091

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)	0.00084	0.00085	0.00085
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00088	0.00090	0.00089
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00091	0.00091	0.00091

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)	-0.00078	-0.00078	-0.00081

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)	0.00081	0.00082	0.00081

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00237	0.00250	0.00269	0.00265	0.20953

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00281	0.00876

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)	0.25428	1.58597	12.92640
	A1->Y (FR)	0.22446	1.51336	12.66790
	B0->Y (FR)	0.15754	1.44279	12.59210
	B1->Y (FR)	0.19081	1.51506	12.87990

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)	0.12503	0.86797	7.87424
	A1->Y (RF)	0.10644	0.84428	7.83322
	B0->Y (RF)	0.08999	0.83037	8.00445
	B1->Y (RF)	0.10990	0.85550	8.05289

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	0.00353	0.00349	0.00325
	A1	0.00313	0.00306	0.00305
	B0	0.00232	0.00227	0.00224
	B1	0.00274	0.00270	0.00268

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00089	0.00082	0.00077
	A1	0.00047	0.00046	0.00040
	B0	0.00047	0.00044	0.00039
	B1	0.00089	0.00081	0.00076

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)	-0.00077	-0.00086	-0.00086
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00077	-0.00086	-0.00086
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00084	-0.00086	-0.00085
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00087	-0.00088	-0.00088

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)	0.00086	0.00086	0.00086
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00086	0.00086	0.00086
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00086	0.00086	0.00085
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00088	0.00088	0.00088

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)	-0.00049	-0.00049	-0.00048
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00049	-0.00049	-0.00048
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00084	-0.00084	-0.00085
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00087	-0.00088	-0.00087

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)	0.00052	0.00053	0.00050
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00052	0.00052	0.00050
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00084	0.00084	0.00085
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00087	0.00088	0.00088

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)	-0.00049	-0.00049	-0.00049
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00049	-0.00049	-0.00049
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00101	-0.00102	-0.00102
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00100	-0.00100	-0.00104

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)	0.00053	0.00053	0.00050
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00053	0.00053	0.00050
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00102	0.00102	0.00102
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00104	0.00105	0.00105

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)	-0.00076	-0.00085	-0.00085
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00076	-0.00085	-0.00085
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00103	-0.00105	-0.00105
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00102	-0.00103	-0.00106

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)	0.00085	0.00085	0.00085
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00085	0.00085	0.00085
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00105	0.00105	0.00105
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00107	0.00109	0.00107

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00286	0.00263	0.43484
sky130_osu_sc_12T_ms__or2_2	0.00286	0.00263	0.90250
sky130_osu_sc_12T_ms__or2_4	0.00285	0.00263	1.78792
sky130_osu_sc_12T_ms__or2_8	0.00285	0.00263	3.51153
sky130_osu_sc_12T_ms__or2_l	0.00217	0.00202	0.34004

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00307	0.00466
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00427	0.00904
sky130_osu_sc_12T_ms__or2_4	0.00000	0.00667	0.01780
sky130_osu_sc_12T_ms__or2_8	0.00000	0.01147	0.03532
sky130_osu_sc_12T_ms__or2_l	0.00000	0.02694	0.04496

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)	0.14332	1.14333	9.30458
	B->Y (RR)	0.13187	1.11674	9.12081
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.14914	1.01677	9.64492
	B->Y (RR)	0.13709	0.99568	9.49659
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.19394	0.97645	10.07990
	B->Y (RR)	0.18142	0.95957	9.97347
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.28454	1.01337	10.67460
	B->Y (RR)	0.27169	1.00047	10.60490
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.14441	1.18298	9.05299
	B->Y (RR)	0.13355	1.15677	8.86335

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)	0.35091	1.09846	7.49993
	B->Y (FF)	0.30591	1.02379	6.91212
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.43431	1.15549	8.04621
	B->Y (FF)	0.38925	1.07952	7.54304
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.62838	1.35155	8.75995
	B->Y (FF)	0.58402	1.27077	8.36735
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	1.01464	1.78175	9.67222
	B->Y (FF)	0.96948	1.70012	9.40702
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.34472	1.11700	7.14883
	B->Y (FF)	0.30577	1.03250	6.44857

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	0.00184	0.00166	0.00162
	B	0.00000	0.00000	0.00000
	B	0.00141	0.00124	0.00124
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00298	0.00290	0.00285
	B	0.00000	0.00000	0.00000
	B	0.00253	0.00250	0.00251
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00560	0.00571	0.00566
	B	0.00000	0.00000	0.00000
	B	0.00514	0.00533	0.00533
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01077	0.01111	0.01150
	B	0.00000	0.00000	0.00000
	B	0.01031	0.01074	0.01105
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00142	0.00130	0.00128
	B	0.00000	0.00000	0.00000
	B	0.00111	0.00099	0.00104

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	0.00387	0.00378	0.00374
	B	0.00000	0.00000	0.00000
	B	0.00334	0.00329	0.00334
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00469	0.00480	0.00476
	B	0.00000	0.00000	0.00000
	B	0.00416	0.00429	0.00434
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00677	0.00721	0.00725
	B	0.00000	0.00000	0.00000
	B	0.00624	0.00667	0.00678
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01097	0.01184	0.01225
	B	0.00000	0.00000	0.00000
	B	0.01043	0.01130	0.01175
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00290	0.00283	0.00281
	B	0.00000	0.00000	0.00000
	B	0.00253	0.00250	0.00265

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)	-0.00080	-0.00089	-0.00089
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00079	-0.00089	-0.00089
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00080	-0.00089	-0.00089
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00080	-0.00089	-0.00089
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00052	-0.00060	-0.00061

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)	0.00088	0.00090	0.00089
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00088	0.00090	0.00089
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00088	0.00090	0.00089
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00088	0.00090	0.00089
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00061	0.00062	0.00061

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)	-0.00050	-0.00050	-0.00050
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00050	-0.00050	-0.00050
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00050	-0.00051	-0.00050
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00050	-0.00050	-0.00050
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00034	-0.00034	-0.00034

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)	0.00054	0.00054	0.00051
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00054	0.00055	0.00051
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00055	0.00055	0.00051
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00055	0.00055	0.00051
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00037	0.00037	0.00035

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00276	0.00363	0.20900
sky130_osu_sc_12T_ms__tbufi_l	0.00214	0.00280	0.15513

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00236	0.00876
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.02251	0.08965

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)	0.13810	1.42288	12.55530
	OE->Y (FR)	0.09466	0.48588	3.47361
	OE->Y (RR)	0.19952	1.41684	9.31526
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.14914	1.45026	11.69100
	OE->Y (FR)	0.08877	0.43867	3.47284
	OE->Y (RR)	0.20350	1.47166	8.91439

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)	0.06308	0.77991	7.80981
	OE->Y (FF)	0.09649	0.48845	3.47361
	OE->Y (RF)	0.06085	0.77668	7.69884
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.06953	0.81730	7.72221
	OE->Y (FF)	0.09004	0.44045	3.47285
	OE->Y (RF)	0.06596	0.81060	7.57987

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	0.00169	0.00164	0.00161
	OE	0.00000	0.00000	0.00000
	OE	0.00159	0.00136	0.00139
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00129	0.00124	0.00124
	OE	0.00000	0.00000	0.00000
	OE	0.00117	0.00100	0.00107

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	-0.00016	-0.00018	-0.00021
	OE	0.00000	0.00000	0.00000
	OE	0.00108	0.00086	0.00088
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00009	-0.00011	-0.00014
	OE	0.00000	0.00000	0.00000
	OE	0.00076	0.00060	0.00066

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)	-0.00082	-0.00082	-0.00082
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00075	-0.00076	-0.00075
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00059	-0.00059	-0.00059
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00054	-0.00055	-0.00054

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)	0.00082	0.00082	0.00082
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00078	0.00079	0.00077
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00059	0.00059	0.00059
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00057	0.00057	0.00056

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)	0.00061	0.00039	0.00041
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00054	0.00032	0.00033
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00044	0.00027	0.00034
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00037	0.00021	0.00027

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)	0.00203	0.00183	0.00188
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00207	0.00189	0.00192
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00156	0.00142	0.00156
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00158	0.00145	0.00160

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00275	0.00401	0.20899
sky130_osu_sc_12T_ms__tnbufi_l	0.00204	0.00308	0.15709

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00378	0.00452
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.03743	0.04491

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)	0.13930	1.42252	12.55450
	OE->Y (RR)	0.04410	0.31753	3.47304
	OE->Y (FR)	0.15424	1.47837	12.80760
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.14626	1.45699	11.77280
	OE->Y (RR)	0.04682	0.32192	3.47281
	OE->Y (FR)	0.15814	1.52910	12.36370

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)	0.06135	0.77921	7.80901
	OE->Y (RF)	0.04342	0.31528	3.47309
	OE->Y (FF)	0.13964	0.88309	5.87567
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.06562	0.81780	7.75746
	OE->Y (RF)	0.04641	0.32062	3.47281
	OE->Y (FF)	0.14576	0.89129	5.29410

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	0.00175	0.00170	0.00168
	OE	0.00000	0.00000	0.00000
	OE	0.00405	0.00392	0.00382
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00132	0.00128	0.00128
	OE	0.00000	0.00000	0.00000
	OE	0.00311	0.00301	0.00323

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	-0.00024	-0.00026	-0.00030
	OE	0.00000	0.00000	0.00000
	OE	0.00361	0.00349	0.00358
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00018	-0.00019	-0.00023
	OE	0.00000	0.00000	0.00000
	OE	0.00277	0.00267	0.00287

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)	-0.00067	-0.00068	-0.00067
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00061	-0.00062	-0.00061
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00046	-0.00046	-0.00046
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00042	-0.00042	-0.00042

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)	0.00067	0.00068	0.00067
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00064	0.00064	0.00063
sky130_osu_sc_12T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00046	0.00046	0.00046
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00044	0.00044	0.00043

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)	-0.00094	-0.00123	-0.00123
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00092	-0.00121	-0.00122
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00063	-0.00087	-0.00082
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00065	-0.00087	-0.00082

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)	0.00307	0.00295	0.00303
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00301	0.00288	0.00297
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00238	0.00230	0.00249
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00235	0.00225	0.00245

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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_l	14.16360

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__xnor2_l	0.00551	0.00462	0.21382

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.00812	0.01328

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	0.25986	1.49762	9.66276
	A->Y (FR)	!B	0.18257	1.48083	12.71180
	B->Y (RR)	A	0.21811	1.45125	9.55541
	B->Y (FR)	!A	0.20914	1.54098	12.96250

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	0.21603	0.99242	6.43193
	A->Y (RF)	!B	0.08695	0.80372	7.78631
	B->Y (FF)	A	0.19844	0.97020	6.38582
	B->Y (RF)	!A	0.09773	0.81897	7.80685

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	0.00168	0.00143	0.00140
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00431	0.00410	0.00414
	B	A	0.00000	0.00000	0.00000
	B	A	0.00096	0.00078	0.00077
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00439	0.00423	0.00409

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	0.00504	0.00482	0.00480
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00119	0.00096	0.00092
	B	A	0.00000	0.00000	0.00000
	B	A	0.00451	0.00440	0.00445
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00160	0.00135	0.00131

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.00554	0.00466	0.20401

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.00812	0.01383

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	0.27107	1.50120	9.51619
	A->Y (FR)	B	0.21238	1.53611	12.84110
	B->Y (RR)	!A	0.22711	1.46369	9.47364
	B->Y (FR)	A	0.22727	1.55913	12.86930

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	0.22089	0.98526	6.34996
	A->Y (RF)	B	0.08392	0.80361	7.77571
	B->Y (FF)	!A	0.20561	0.96668	6.28959
	B->Y (RF)	A	0.09135	0.80737	7.66530

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	0.00487	0.00468	0.00450
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00117	0.00081	0.00076
	B	A	0.00000	0.00000	0.00000
	B	A	0.00488	0.00473	0.00460
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00091	0.00071	0.00070

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	0.00109	0.00079	0.00072
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00521	0.00506	0.00508
	B	A	0.00000	0.00000	0.00000
	B	A	0.00109	0.00083	0.00078
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00458	0.00449	0.00454

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P20_25C.ccs
Cell Library: Process , Voltage 1.20,
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	0.08693
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	27534.50000	55068.90000
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
	-0.00092	0.00416	0.06312

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
	0.47977	0.45137	0.08561