sky130_osu_sc_12T_ms_tt_1P44_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_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.01059	0.01064	0.00818	0.83797	0.36147	0.75754
sky130_osu_sc_12T_ms__addf_l	0.01059	0.01064	0.00818	0.58922	0.36245	0.75754

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addf_1	0.00000	0.02251	0.02788
sky130_osu_sc_12T_ms__addf_l	0.00000	0.07785	0.13864

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)	0.20967	2.03018	25.13370
	B->CO (RR)	0.20264	1.97482	24.54220
	CI->CO (RR)	0.19762	2.03994	25.48550
	CON->CO (FR)	0.03702	0.88194	12.03910
sky130_osu_sc_12T_ms__addf_1	A->CO (RR)	0.20406	1.85360	20.40180
	B->CO (RR)	0.19753	1.81315	20.12590
	CI->CO (RR)	0.19202	1.86343	20.78010
	CON->CO (FR)	0.04199	0.91724	11.45210

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)	0.35299	2.92225	35.38160
	B->CO (FF)	0.31950	2.80822	34.19670
	CI->CO (FF)	0.31450	2.87317	35.34830
	CON->CO (RF)	0.02677	0.63741	8.79157
sky130_osu_sc_12T_ms__addf_1	A->CO (FF)	0.34390	2.60490	27.79240
	B->CO (FF)	0.31156	2.50758	26.94950
	CI->CO (FF)	0.30548	2.55464	27.77690
	CON->CO (RF)	0.02979	0.66600	8.55120

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)	0.25744	1.28526	11.82640
	B->CON (FR)	0.22519	1.21609	11.50760
	CI->CON (FR)	0.21929	1.23566	11.84040
sky130_osu_sc_12T_ms__addf_l	A->CON (FR)	0.24557	1.27451	11.83380
	B->CON (FR)	0.21408	1.20590	11.51450
	CI->CON (FR)	0.20755	1.22495	11.84770

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)	0.12045	0.71047	7.15188
	B->CON (RF)	0.11589	0.70871	7.35709
	CI->CON (RF)	0.10848	0.72205	7.58508
sky130_osu_sc_12T_ms__addf_l	A->CON (RF)	0.11666	0.70719	7.15730
	B->CON (RF)	0.11224	0.70563	7.36278
	CI->CON (RF)	0.10467	0.71878	7.59059

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)	0.50032	2.77886	27.69250
	B->S (-R)	0.50250	2.75126	27.18250
	CI->S (-R)	0.45883	2.72220	27.64740
	CON->S (RR)	0.11758	0.88171	8.12920
sky130_osu_sc_12T_ms__addf_l	A->S (-R)	0.48210	2.76503	27.67950
	B->S (-R)	0.48468	2.73778	27.17990
	CI->S (-R)	0.44066	2.70804	27.63490
	CON->S (RR)	0.11764	0.88169	8.12873

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)	0.37158	1.81839	16.93950
	B->S (-F)	0.36429	1.74055	16.61890
	CI->S (-F)	0.35854	1.82308	17.29570
	CON->S (FF)	0.16066	0.80284	6.34499
sky130_osu_sc_12T_ms__addf_l	A->S (-F)	0.36300	1.81216	16.93420
	B->S (-F)	0.35608	1.73490	16.61500
	CI->S (-F)	0.34997	1.81735	17.28770
	CON->S (FF)	0.16072	0.80281	6.34492

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	0.00188	0.00179	0.00215
	B	0.00221	0.00220	0.00257
	CI	0.00221	0.00229	0.00275
sky130_osu_sc_12T_ms__addf_l	A	0.00171	0.00160	0.00183
	B	0.00203	0.00201	0.00227
	CI	0.00204	0.00210	0.00244

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00580	0.00582	0.00664
	B	0.00570	0.00579	0.00667
	CI	0.00502	0.00517	0.00607
sky130_osu_sc_12T_ms__addf_l	A	0.00566	0.00566	0.00615
	B	0.00555	0.00564	0.00617
	CI	0.00487	0.00501	0.00557

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00579	0.00578	0.00600
	B	0.00569	0.00575	0.00598
	CI	0.00501	0.00512	0.00542
sky130_osu_sc_12T_ms__addf_l	A	0.00565	0.00564	0.00585
	B	0.00555	0.00561	0.00583
	CI	0.00486	0.00498	0.00527

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00186	0.00176	0.00186
	B	0.00218	0.00215	0.00226
	CI	0.00221	0.00226	0.00244
sky130_osu_sc_12T_ms__addf_l	A	0.00169	0.00158	0.00170
	B	0.00201	0.00198	0.00210
	CI	0.00204	0.00208	0.00229

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.00580	0.00582	0.00651
	B	0.00570	0.00579	0.00654
	CI	0.00502	0.00516	0.00595
sky130_osu_sc_12T_ms__addf_l	A	0.00566	0.00567	0.00636
	B	0.00556	0.00564	0.00638
	CI	0.00487	0.00502	0.00578

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__addf_1	A	0.01170	0.01171	0.01188
	B	0.01081	0.01052	0.01155
	CI	0.00967	0.00958	0.00985
sky130_osu_sc_12T_ms__addf_l	A	0.01170	0.01171	0.01188
	B	0.01082	0.01052	0.01156
	CI	0.00967	0.00959	0.00985

SKY130_OSU_SC_12T_MS__ADDHx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00522	0.00547	0.81522	0.83346	0.84306
sky130_osu_sc_12T_ms__addh_l	0.00523	0.00547	0.58672	0.83570	0.59798

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__addh_1	0.00000	0.02627	0.02773
sky130_osu_sc_12T_ms__addh_l	0.00000	0.13696	0.13844

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)	0.14432	0.89298	8.05584
	B->CO (RR)	0.14833	0.89384	8.19579
sky130_osu_sc_12T_ms__addh_l	A->CO (RR)	0.13957	0.92768	7.74836
	B->CO (RR)	0.14328	0.93138	7.89253

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)	0.12808	0.77507	6.62052
	B->CO (FF)	0.13398	0.78986	6.73339
sky130_osu_sc_12T_ms__addh_l	A->CO (FF)	0.12568	0.79977	6.44573
	B->CO (FF)	0.13131	0.81575	6.57034

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)	0.20119	0.92809	8.04609
	B->CON (RR)	0.20471	0.92761	8.18366
sky130_osu_sc_12T_ms__addh_l	A->CON (RR)	0.18714	0.91036	7.99480
	B->CON (RR)	0.19073	0.91052	8.13437

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)	0.16532	0.80275	6.70293
	B->CON (FF)	0.16460	0.81138	6.80985
sky130_osu_sc_12T_ms__addh_l	A->CON (FF)	0.15390	0.78021	6.55921
	B->CON (FF)	0.15300	0.78975	6.66985

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)	0.23543	1.67150	17.70100
	B->S (FR)	0.23464	1.68081	17.81870
	CON->S (FR)	0.03864	0.89304	12.21150
sky130_osu_sc_12T_ms__addh_l	A->S (FR)	0.22322	1.56921	14.70120
	B->S (FR)	0.22246	1.57971	14.80740
	CON->S (FR)	0.04243	0.91940	11.57990

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)	0.26334	1.70695	17.90030
	B->S (RF)	0.26691	1.70517	18.03430
	CON->S (RF)	0.02624	0.63855	8.84277
sky130_osu_sc_12T_ms__addh_l	A->S (RF)	0.25084	1.56139	14.18780
	B->S (RF)	0.25460	1.55937	14.33300
	CON->S (RF)	0.02912	0.66916	8.63878

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	0.00285	0.00272	0.00293
	B	0.00000	0.00000	0.00000
	B	0.00264	0.00252	0.00258
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00253	0.00236	0.00273
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00217	0.00238

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	0.00400	0.00385	0.00412
	B	0.00000	0.00000	0.00000
	B	0.00417	0.00416	0.00444
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00366	0.00351	0.00365
	B	0.00000	0.00000	0.00000
	B	0.00384	0.00381	0.00419

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	0.00285	0.00273	0.00293
	B	0.00000	0.00000	0.00000
	B	0.00264	0.00254	0.00258
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00253	0.00236	0.00262
	B	0.00000	0.00000	0.00000
	B	0.00231	0.00217	0.00227

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	0.00399	0.00385	0.00410
	B	0.00000	0.00000	0.00000
	B	0.00417	0.00417	0.00447
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00366	0.00350	0.00379
	B	0.00000	0.00000	0.00000
	B	0.00384	0.00380	0.00410

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	0.00400	0.00386	0.00402
	B	0.00000	0.00000	0.00000
	B	0.00417	0.00417	0.00442
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00367	0.00352	0.00389
	B	0.00000	0.00000	0.00000
	B	0.00384	0.00381	0.00416

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	0.00285	0.00272	0.00294
	B	0.00000	0.00000	0.00000
	B	0.00264	0.00252	0.00258
sky130_osu_sc_12T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00252	0.00236	0.00266
	B	0.00000	0.00000	0.00000
	B	0.00232	0.00217	0.00228

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)	0.53767	0.51155	0.14159
sky130_osu_sc_12T_ms__addh_l	(!B * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!B * !CO * !CON * S)	0.53771	0.51160	0.14163

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)	0.53757	0.51091	0.14016
sky130_osu_sc_12T_ms__addh_l	(!A * !CO * !CON * S)	0.00000	0.00000	0.00000
	(!A * !CO * !CON * S)	0.53761	0.51096	0.14020

SKY130_OSU_SC_12T_MS__AND2x

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00278	0.00288	0.82352
sky130_osu_sc_12T_ms__and2_2	0.00278	0.00288	1.63542
sky130_osu_sc_12T_ms__and2_4	0.00278	0.00288	3.20255
sky130_osu_sc_12T_ms__and2_6	0.00281	0.00288	4.75768
sky130_osu_sc_12T_ms__and2_8	0.00278	0.00288	6.20179
sky130_osu_sc_12T_ms__and2_l	0.00212	0.00219	0.59022

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__and2_1	0.00000	0.01151	0.01836
sky130_osu_sc_12T_ms__and2_2	0.00000	0.01837	0.01857
sky130_osu_sc_12T_ms__and2_4	0.00000	0.03208	0.03651
sky130_osu_sc_12T_ms__and2_6	0.00000	0.04580	0.05465
sky130_osu_sc_12T_ms__and2_8	0.00000	0.05952	0.07280
sky130_osu_sc_12T_ms__and2_l	0.00000	0.14992	0.23983

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)	0.10962	0.82177	7.76170
	B->Y (RR)	0.11624	0.83285	7.90531
sky130_osu_sc_12T_ms__and2_2	A->Y (RR)	0.12383	0.74849	7.95814
	B->Y (RR)	0.13031	0.75203	8.09565
sky130_osu_sc_12T_ms__and2_4	A->Y (RR)	0.17022	0.75534	8.44116
	B->Y (RR)	0.17661	0.75013	8.55538
sky130_osu_sc_12T_ms__and2_6	A->Y (RR)	0.21649	0.79332	8.81231
	B->Y (RR)	0.22303	0.78428	8.89788
sky130_osu_sc_12T_ms__and2_8	A->Y (RR)	0.26111	0.83895	9.05635
	B->Y (RR)	0.26743	0.82636	9.11912
sky130_osu_sc_12T_ms__and2_l	A->Y (RR)	0.11292	0.87024	7.57601
	B->Y (RR)	0.11904	0.87841	7.66426

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)	0.10000	0.69566	6.06116
	B->Y (FF)	0.10343	0.70973	6.16327
sky130_osu_sc_12T_ms__and2_2	A->Y (FF)	0.11786	0.67822	6.35158
	B->Y (FF)	0.12033	0.68711	6.45145
sky130_osu_sc_12T_ms__and2_4	A->Y (FF)	0.16772	0.71882	6.90603
	B->Y (FF)	0.16739	0.72007	6.96762
sky130_osu_sc_12T_ms__and2_6	A->Y (FF)	0.21976	0.77047	7.29832
	B->Y (FF)	0.21613	0.76839	7.34046
sky130_osu_sc_12T_ms__and2_8	A->Y (FF)	0.26836	0.81935	7.53168
	B->Y (FF)	0.26239	0.81349	7.56403
sky130_osu_sc_12T_ms__and2_l	A->Y (FF)	0.09915	0.69551	5.52769
	B->Y (FF)	0.10663	0.71381	5.59132

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	0.00200	0.00173	0.00302
	B	0.00000	0.00000	0.00000
	B	0.00205	0.00174	0.00240
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00368	0.00359	0.00475
	B	0.00000	0.00000	0.00000
	B	0.00372	0.00361	0.00420
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00755	0.00776	0.00877
	B	0.00000	0.00000	0.00000
	B	0.00759	0.00780	0.00838
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01142	0.01179	0.01319
	B	0.00000	0.00000	0.00000
	B	0.01144	0.01186	0.01275
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01529	0.01592	0.01752
	B	0.00000	0.00000	0.00000
	B	0.01536	0.01590	0.01713
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00155	0.00138	0.00341
	B	0.00000	0.00000	0.00000
	B	0.00158	0.00138	0.00257

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	0.00497	0.00489	0.00631
	B	0.00000	0.00000	0.00000
	B	0.00563	0.00549	0.00678
sky130_osu_sc_12T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00620	0.00641	0.00776
	B	0.00000	0.00000	0.00000
	B	0.00688	0.00699	0.00823
sky130_osu_sc_12T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.00931	0.01004	0.01141
	B	0.00000	0.00000	0.00000
	B	0.00997	0.01058	0.01180
sky130_osu_sc_12T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.01247	0.01373	0.01521
	B	0.00000	0.00000	0.00000
	B	0.01316	0.01423	0.01552
sky130_osu_sc_12T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.01552	0.01724	0.01892
	B	0.00000	0.00000	0.00000
	B	0.01620	0.01770	0.01914
sky130_osu_sc_12T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00377	0.00374	0.00624
	B	0.00000	0.00000	0.00000
	B	0.00423	0.00419	0.00653

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)	-0.00166	-0.00167	-0.00168
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00166	-0.00167	-0.00168
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00166	-0.00167	-0.00168
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00167	-0.00168	-0.00169
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00165	-0.00167	-0.00168
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00117	-0.00117	-0.00118

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)	0.00167	0.00171	0.00168
sky130_osu_sc_12T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00167	0.00171	0.00168
sky130_osu_sc_12T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00168	0.00170	0.00168
sky130_osu_sc_12T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00169	0.00171	0.00170
sky130_osu_sc_12T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00169	0.00169	0.00168
sky130_osu_sc_12T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00118	0.00121	0.00119

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)	-0.00158	-0.00159	-0.00158
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00158	-0.00158	-0.00158
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00158	-0.00158	-0.00158
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00157	-0.00158	-0.00158
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00157	-0.00158	-0.00158
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00112	-0.00112	-0.00112

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)	0.00159	0.00161	0.00158
sky130_osu_sc_12T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00159	0.00161	0.00159
sky130_osu_sc_12T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00159	0.00159	0.00159
sky130_osu_sc_12T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00159	0.00158	0.00158
sky130_osu_sc_12T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00159	0.00158	0.00159
sky130_osu_sc_12T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00113	0.00114	0.00112

SKY130_OSU_SC_12T_MS__AOI21

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00252	0.00271	0.00267	0.34673

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__aoi21_l	0.00000	0.00475	0.00930

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)	0.13290	1.17294	11.65780
	A1->Y (FR)	0.10810	1.08432	11.11980
	B0->Y (FR)	0.10296	1.13384	11.74920

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)	0.06104	0.63301	6.86168
	A1->Y (RF)	0.05607	0.64145	7.15562
	B0->Y (RF)	0.03544	0.57726	6.73476

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	0.00406	0.00400	0.00399
	A1	0.00000	0.00000	0.00000
	A1	0.00343	0.00336	0.00334
	B0	0.00335	0.00327	0.00339

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	0.00088	0.00075	0.00074
	A1	0.00000	0.00000	0.00000
	A1	0.00090	0.00075	0.00078
	B0	-0.00029	-0.00035	-0.00032

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)	-0.00122	-0.00134	-0.00134
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00136	-0.00137	-0.00137
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00137	-0.00138	-0.00137

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)	0.00133	0.00136	0.00134
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00136	0.00139	0.00137
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00138	0.00139	0.00137

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)	-0.00122	-0.00134	-0.00134
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00137	-0.00137	-0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00151	-0.00152	-0.00153

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)	0.00134	0.00134	0.00134
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00137	0.00138	0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00153	0.00156	0.00153

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)	-0.00070	-0.00071	-0.00070

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)	0.00078	0.00079	0.00072

SKY130_OSU_SC_12T_MS__AOI22

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00252	0.00271	0.00284	0.00265	0.34677

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_12T_ms__aoi22_l	0.00000	0.00541	0.01815

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)	0.16975	1.21947	11.74380
	A1->Y (FR)	0.15156	1.19448	11.68430
	B0->Y (FR)	0.10868	1.13916	11.75730
	B1->Y (FR)	0.12717	1.16318	11.82550

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)	0.07860	0.65271	6.88515
	A1->Y (RF)	0.07353	0.66046	7.17998
	B0->Y (RF)	0.04436	0.62495	7.13846
	B1->Y (RF)	0.04950	0.61680	6.84452

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	0.00503	0.00498	0.00495
	A1	0.00441	0.00433	0.00429
	B0	0.00358	0.00347	0.00360
	B1	0.00421	0.00414	0.00426

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__aoi22_l	A0	0.00174	0.00162	0.00158
	A1	0.00175	0.00161	0.00161
	B0	-0.00016	-0.00022	-0.00018
	B1	-0.00014	-0.00020	-0.00020

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)	-0.00124	-0.00134	-0.00134
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00136	-0.00137	-0.00137
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00137	-0.00137	-0.00137
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00137	-0.00137	-0.00137

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)	0.00133	0.00135	0.00134
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00136	0.00139	0.00137
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00138	0.00139	0.00137
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00138	0.00139	0.00137

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)	-0.00125	-0.00134	-0.00134
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00137	-0.00138	-0.00137
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00150	-0.00151	-0.00152
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00150	-0.00151	-0.00152

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)	0.00134	0.00136	0.00134
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00137	0.00139	0.00138
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00152	0.00155	0.00153
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00152	0.00155	0.00153

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)	-0.00069	-0.00071	-0.00069
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00069	-0.00069	-0.00069
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00158	-0.00159	-0.00160
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00158	-0.00158	-0.00160

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)	0.00082	0.00082	0.00072
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00069	0.00070	0.00069
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00159	0.00160	0.00160
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00159	0.00160	0.00160

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)	-0.00070	-0.00071	-0.00070
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00070	-0.00070	-0.00070
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00145	-0.00145	-0.00145
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00145	-0.00145	-0.00145

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)	0.00082	0.00083	0.00073
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00070	0.00070	0.00070
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00146	0.00147	0.00145
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00146	0.00147	0.00145

SKY130_OSU_SC_12T_MS__BUFx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00289	0.76643
sky130_osu_sc_12T_ms__buf_2	0.00289	1.57984
sky130_osu_sc_12T_ms__buf_4	0.00289	3.16661
sky130_osu_sc_12T_ms__buf_6	0.00083	1.80000
sky130_osu_sc_12T_ms__buf_8	0.00289	6.21109
sky130_osu_sc_12T_ms__buf_l	0.00216	0.59254

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__buf_1	0.00000	0.00929	0.00929
sky130_osu_sc_12T_ms__buf_2	0.00000	0.01393	0.01836
sky130_osu_sc_12T_ms__buf_4	0.00000	0.02321	0.03651
sky130_osu_sc_12T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__buf_8	0.00000	0.04179	0.07280
sky130_osu_sc_12T_ms__buf_l	0.00000	0.11997	0.11997

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)**	0.08137	0.79046	7.60511
sky130_osu_sc_12T_ms__buf_2	**A->Y (RR)**	0.08584	0.69435	7.79407
sky130_osu_sc_12T_ms__buf_4	**A->Y (RR)**	0.11471	0.68164	8.27636
sky130_osu_sc_12T_ms__buf_8	**A->Y (RR)**	0.17233	0.72118	8.82090
sky130_osu_sc_12T_ms__buf_l	**A->Y (RR)**	0.08360	0.83112	7.47705

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)**	0.09479	0.67314	5.71710
sky130_osu_sc_12T_ms__buf_2	**A->Y (FF)**	0.11266	0.66546	6.18534
sky130_osu_sc_12T_ms__buf_4	**A->Y (FF)**	0.16258	0.70951	6.82536
sky130_osu_sc_12T_ms__buf_8	**A->Y (FF)**	0.26275	0.81224	7.51856
sky130_osu_sc_12T_ms__buf_l	**A->Y (FF)**	0.09622	0.68942	5.50986

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	0.00194	0.00163	0.00268
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00361	0.00343	0.00452
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00747	0.00761	0.00851
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01515	0.01571	0.01723
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00151	0.00139	0.00299

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	0.00486	0.00471	0.00603
sky130_osu_sc_12T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00609	0.00613	0.00740
sky130_osu_sc_12T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.00921	0.00971	0.01096
sky130_osu_sc_12T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.01557	0.01679	0.01825
sky130_osu_sc_12T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00375	0.00375	0.00621

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
	-0.00042	-0.00042	-0.00041

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
	0.00042	0.00042	0.00041

SKY130_OSU_SC_12T_MS__DFFNRx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00264	0.00264	0.00855	0.81372	0.81380
sky130_osu_sc_12T_ms__dffnr_l	0.00264	0.00264	0.00855	0.59043	0.59550

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffnr_1	0.00000	0.09112	0.18961
sky130_osu_sc_12T_ms__dffnr_l	0.00000	0.20180	0.30029

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_12T_ms__dffnr_1	CK->Q (FR)	0.57824	1.99723	16.97710
	QN->Q (FR)	0.04197	0.95693	12.94430
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FR)	0.56508	2.06756	16.34730
	QN->Q (FR)	0.04470	0.96893	12.08970

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)	0.36684	1.84364	18.33530
	QN->Q (RF)	0.02901	0.67923	9.30495
	RN->Q (FF)	0.33127	1.85012	18.59840
sky130_osu_sc_12T_ms__dffnr_l	CK->Q (FF)	0.36838	1.98067	18.05310
	QN->Q (RF)	0.03130	0.70267	9.01805
	RN->Q (FF)	0.33320	1.98639	18.31130

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)	0.31476	1.10259	8.97951
	RN->QN (FR)	0.27903	1.10729	9.24120
sky130_osu_sc_12T_ms__dffnr_l	CK->QN (FR)	0.30958	1.15194	8.84579
	RN->QN (FR)	0.27403	1.15641	9.10083

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)**	0.50749	1.17216	6.62475
sky130_osu_sc_12T_ms__dffnr_l	**CK->QN (FF)**	0.49323	1.18708	6.59125

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)	-0.12681	-0.33571	-1.84575
	setup	CK (F)	0.25507	0.36211	1.88446
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.12781	-0.33571	-1.83801
	setup	CK (F)	0.25607	0.36232	1.88221

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)	-0.12209	-0.15941	-0.83466
	setup	CK (F)	0.27245	0.29441	1.54312
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.12038	-0.15950	-0.83522
	setup	CK (F)	0.27223	0.29424	1.55149

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)	-0.12681	-0.33571	-1.84575
	setup	CK (F)	0.25507	0.36211	1.88446
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.12781	-0.33571	-1.83801
	setup	CK (F)	0.25607	0.36232	1.88221

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)	-0.12209	-0.15941	-0.83466
	setup	CK (F)	0.27245	0.29441	1.54312
sky130_osu_sc_12T_ms__dffnr_l	hold	CK (F)	-0.12038	-0.15950	-0.83522
	setup	CK (F)	0.27223	0.29424	1.55149

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)	0.21179	0.20520	-0.13247
	removal	CK (F)	-0.12930	-0.14129	0.14989
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.21247	0.20559	-0.13206
	removal	CK (F)	-0.12930	-0.14129	0.14989

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)	0.21179	0.20520	-0.13247
	removal	CK (F)	-0.12930	-0.14129	0.14989
sky130_osu_sc_12T_ms__dffnr_l	recovery	CK (F)	0.21247	0.20559	-0.13206
	removal	CK (F)	-0.12930	-0.14129	0.14989

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 ()	0.20590	0.46464	13.33370
	min_pulse_width	RN ()	0.20940	0.46464	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	RN ()	0.20057	0.46020	13.33370
	min_pulse_width	RN ()	0.20148	0.46242	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 ()	0.25250	0.46020	13.33370
	min_pulse_width	CK ()	0.32173	0.46020	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.25250	0.46020	13.33370
	min_pulse_width	CK ()	0.32173	0.46020	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 ()	0.24557	0.46020	13.33370
	min_pulse_width	CK ()	0.18672	0.46020	13.33370
sky130_osu_sc_12T_ms__dffnr_l	min_pulse_width	CK ()	0.23865	0.46020	13.33370
	min_pulse_width	CK ()	0.18326	0.46020	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	0.00938	0.00891	0.00318
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00889	0.00853	0.00556

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	0.00927	0.00870	0.00526
	RN	-0.00066	-0.03193	-0.42183
	RN	0.01217	0.01165	0.00731
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00876	0.00831	0.00716
	RN	-0.00066	-0.02634	-0.30608
	RN	0.01165	0.01126	0.00916

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	0.00927	0.00870	0.00526
	RN	-0.00066	-0.03193	-0.42187
	RN	0.01217	0.01165	0.00731
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00876	0.00832	0.00711
	RN	-0.00066	-0.02647	-0.30871
	RN	0.01165	0.01126	0.00910

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	0.00936	0.00889	0.00338
sky130_osu_sc_12T_ms__dffnr_l	CK	0.00000	0.00000	0.00000
	CK	0.00886	0.00851	0.00565

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)	0.00598	0.00567	0.00603
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00196	0.00171	0.00213
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00133	-0.00151	-0.00152
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)	0.00598	0.00567	0.00603
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00196	0.00171	0.00213
	!CK	0.00000	0.00000	0.00000
	!CK	-0.00133	-0.00151	-0.00152

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)	0.00917	0.00900	0.00933
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00494	0.00479	0.00516
	!CK	0.00000	0.00000	0.00000
	!CK	0.00151	0.00152	0.00152
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)	0.00918	0.00900	0.00933
	(CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN)	0.00494	0.00479	0.00516
	!CK	0.00000	0.00000	0.00000
	!CK	0.00151	0.00152	0.00152

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)	0.00611	0.00564	0.00668
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00195	0.00161	0.00263
sky130_osu_sc_12T_ms__dffnr_l	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00611	0.00564	0.00668
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00195	0.00161	0.00263

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)	0.00928	0.00894	0.01005
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00491	0.00471	0.00601
sky130_osu_sc_12T_ms__dffnr_1	(CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * D * !Q * QN)	0.00928	0.00894	0.01005
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !D * !Q * QN) + (!CK * !Q * QN)	0.00492	0.00472	0.00601

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)	-0.00017	-0.00063	0.00027
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00665	0.00561	0.00750
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00190	0.00106	0.00320
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00778	0.00704	0.00796
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00013	-0.00063	0.00032
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00017	-0.00063	0.00027
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.00665	0.00561	0.00751
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00190	0.00106	0.00320
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.00778	0.00705	0.00797
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00013	-0.00063	0.00032

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)	0.00777	0.00748	0.00869
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00995	0.00949	0.01208
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00817	0.00789	0.00909
sky130_osu_sc_12T_ms__dffnr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00777	0.00748	0.00869
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00995	0.00949	0.01208
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00817	0.00788	0.00909

SKY130_OSU_SC_12T_MS__DFFRx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00264	0.00264	0.00828	0.82289	0.81372
sky130_osu_sc_12T_ms__dffr_l	0.00264	0.00264	0.00828	0.59568	0.59273

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffr_1	0.00000	0.09112	0.18978
sky130_osu_sc_12T_ms__dffr_l	0.00000	0.20180	0.30046

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)	0.46678	1.77077	15.74130
	QN->Q (FR)	0.04197	0.96068	13.02980
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RR)	0.45364	1.83915	15.07570
	QN->Q (FR)	0.04470	0.97173	12.15340

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)	0.45990	1.88346	17.69950
	QN->Q (RF)	0.02900	0.68152	9.35130
	RN->Q (FF)	0.33188	1.85874	18.78380
sky130_osu_sc_12T_ms__dffr_l	CK->Q (RF)	0.46137	2.01982	17.38890
	QN->Q (RF)	0.03130	0.70464	9.05613
	RN->Q (FF)	0.33372	1.99378	18.45460

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)	0.40783	1.13358	8.16389
	RN->QN (FR)	0.27948	1.10832	9.24283
sky130_osu_sc_12T_ms__dffr_l	CK->QN (RR)	0.40250	1.18162	8.01159
	RN->QN (FR)	0.27438	1.15578	9.07253

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)**	0.39615	0.93768	5.22723
sky130_osu_sc_12T_ms__dffr_l	**CK->QN (RF)**	0.38171	0.95154	5.17244

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)	-0.07849	-0.10723	-0.52012
	setup	CK (R)	0.35909	0.36922	1.56488
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07684	-0.10731	-0.52043
	setup	CK (R)	0.35839	0.37000	1.57761

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)	-0.18653	-0.47191	-4.18500
	setup	CK (R)	0.22532	0.48979	4.21880
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.18612	-0.47085	-4.18267
	setup	CK (R)	0.22391	0.48796	4.22201

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)	-0.07849	-0.10723	-0.52012
	setup	CK (R)	0.35909	0.36922	1.56488
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.07684	-0.10731	-0.52043
	setup	CK (R)	0.35839	0.37000	1.57761

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)	-0.18653	-0.47191	-4.18500
	setup	CK (R)	0.22532	0.48979	4.21880
sky130_osu_sc_12T_ms__dffr_l	hold	CK (R)	-0.18612	-0.47085	-4.18267
	setup	CK (R)	0.22391	0.48796	4.22201

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)	0.31241	0.32576	1.45998
	removal	CK (R)	-0.05061	-0.05880	-0.07935
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.31178	0.32824	1.46952
	removal	CK (R)	-0.05061	-0.05880	-0.07935

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)	0.31241	0.32576	1.45998
	removal	CK (R)	-0.05061	-0.05880	-0.07935
sky130_osu_sc_12T_ms__dffr_l	recovery	CK (R)	0.31178	0.32824	1.46952
	removal	CK (R)	-0.05061	-0.05880	-0.07935

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 ()	0.20940	0.46464	13.33370
	min_pulse_width	RN ()	0.20940	0.46464	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	RN ()	0.20148	0.46242	13.33370
	min_pulse_width	RN ()	0.20148	0.46242	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 ()	0.20403	0.46020	13.33370
	min_pulse_width	CK ()	0.25596	0.46020	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.19018	0.46020	13.33370
	min_pulse_width	CK ()	0.24903	0.46020	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 ()	0.46503	0.52449	13.33370
	min_pulse_width	CK ()	0.18672	0.46020	13.33370
sky130_osu_sc_12T_ms__dffr_l	min_pulse_width	CK ()	0.46503	0.52449	13.33370
	min_pulse_width	CK ()	0.18672	0.46020	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	0.00500	0.00421	-0.00058
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00450	0.00383	0.00146

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	0.00558	0.00497	0.00058
	RN	-0.00066	-0.03214	-0.42658
	RN	0.01264	0.01212	0.00772
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00507	0.00459	0.00248
	RN	-0.00066	-0.02648	-0.30880
	RN	0.01212	0.01174	0.00957

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	0.00558	0.00497	0.00063
	RN	-0.00066	-0.03193	-0.42183
	RN	0.01264	0.01213	0.00778
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00507	0.00459	0.00248
	RN	-0.00066	-0.02640	-0.30727
	RN	0.01212	0.01174	0.00958

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	0.00498	0.00419	-0.00063
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00448	0.00381	0.00140

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	-0.00116	-0.00135	-0.00136
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00607	0.00576	0.00611
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00242	0.00216	0.00259
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00116	-0.00135	-0.00136
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00608	0.00577	0.00612
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00242	0.00216	0.00259

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	0.00135	0.00136	0.00136
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00908	0.00890	0.00924
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00448	0.00434	0.00471
sky130_osu_sc_12T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00135	0.00136	0.00136
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00908	0.00890	0.00925
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00448	0.00434	0.00471

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)	0.00195	0.00161	0.00263
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00579	0.00531	0.00635
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)	0.00195	0.00161	0.00263
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00579	0.00531	0.00635

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)	0.00491	0.00471	0.00601
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00960	0.00926	0.01037
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)	0.00491	0.00471	0.00601
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00960	0.00926	0.01037

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)	-0.00028	-0.00073	0.00018
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00310	0.00237	0.00313
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00032	-0.00080	0.00016
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00028	-0.00073	0.00018
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00310	0.00237	0.00313
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00032	-0.00080	0.00016

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)	0.00764	0.00731	0.00860
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01527	0.01470	0.01558
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01142	0.01105	0.01206
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01501	0.01439	0.01702
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00811	0.00780	0.00906
sky130_osu_sc_12T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00764	0.00731	0.00860
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.01527	0.01470	0.01558
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01142	0.01105	0.01206
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.01501	0.01440	0.01702
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.00812	0.00780	0.00906

SKY130_OSU_SC_12T_MS__DFFSRx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00260	0.00266	0.00621	0.00848	0.83475	0.84186
sky130_osu_sc_12T_ms__dffsr_l	0.00260	0.00266	0.00621	0.00847	0.58996	0.59302

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffsr_1	0.00000	0.03471	0.04729
sky130_osu_sc_12T_ms__dffsr_l	0.00000	0.14539	0.15797

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)	0.49997	1.81317	15.89000
	QN->Q (FR)	0.03972	0.92801	12.65180
	RN->Q (RR)	0.40455	1.73281	15.97650
	SN->Q (FR)	0.38075	1.78878	17.51680
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RR)	0.49392	1.88957	15.09870
	QN->Q (FR)	0.04461	0.96795	12.07850
	RN->Q (RR)	0.39894	1.81109	15.18760
	SN->Q (FR)	0.37477	1.86701	16.68480

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)	0.53415	1.95010	17.69570
	QN->Q (RF)	0.02880	0.68390	9.40434
	RN->Q (FF)	0.35139	1.86927	18.79080
sky130_osu_sc_12T_ms__dffsr_l	CK->Q (RF)	0.53676	2.09351	17.33270
	QN->Q (RF)	0.03114	0.70185	9.00873
	RN->Q (FF)	0.35544	2.01290	18.40840

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)	0.48093	1.21017	8.27989
	RN->QN (FR)	0.29934	1.12819	9.37120
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RR)	0.47627	1.26361	8.11607
	RN->QN (FR)	0.29599	1.18290	9.19091

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)	0.43249	0.99478	5.51921
	RN->QN (RF)	0.33759	0.91630	5.60855
	SN->QN (FF)	0.31382	0.97259	7.13866
sky130_osu_sc_12T_ms__dffsr_l	CK->QN (RF)	0.42365	1.00941	5.33220
	RN->QN (RF)	0.32884	0.93185	5.41932
	SN->QN (FF)	0.30494	0.98799	6.92009

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)	-0.09622	-0.12345	-0.64077
	setup	CK (R)	0.37632	0.37578	1.58773
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.09535	-0.12351	-0.64093
	setup	CK (R)	0.37318	0.38063	1.58941

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)	-0.22062	-0.49857	-4.39422
	setup	CK (R)	0.27085	0.51364	4.42009
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.22085	-0.49674	-4.39518
	setup	CK (R)	0.27074	0.51364	4.42006

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)	-0.09622	-0.12345	-0.64077
	setup	CK (R)	0.37632	0.37578	1.58773
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.09535	-0.12351	-0.64093
	setup	CK (R)	0.37318	0.38063	1.58941

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)	-0.22062	-0.49857	-4.39422
	setup	CK (R)	0.27085	0.51364	4.42009
sky130_osu_sc_12T_ms__dffsr_l	hold	CK (R)	-0.22085	-0.49674	-4.39518
	setup	CK (R)	0.27074	0.51364	4.42006

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)	0.29986	0.30527	1.40209
	removal	CK (R)	-0.04175	-0.04864	-0.12162
	hold	SN (R)	-0.30385	-0.51561	-3.24571
	setup	SN (R)	0.33407	0.56256	5.46833
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.29864	0.30702	1.40990
	removal	CK (R)	-0.04175	-0.04864	-0.12162
	hold	SN (R)	-0.29069	-0.50230	-3.16676
	setup	SN (R)	0.33397	0.54738	5.35045

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)	0.29986	0.30527	1.40209
	removal	CK (R)	-0.04175	-0.04864	-0.12162
	hold	SN (R)	-0.30534	-0.51561	-3.24571
	hold	SN (R)	-0.30385	-0.51666	-3.25075
	setup	SN (R)	0.33177	0.56044	5.32043
	setup	SN (R)	0.33407	0.56256	5.46833
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.29864	0.30702	1.40990
	removal	CK (R)	-0.04175	-0.04864	-0.12162
	hold	SN (R)	-0.29101	-0.50230	-3.16676
	hold	SN (R)	-0.29069	-0.50366	-3.17808
	setup	SN (R)	0.33397	0.54677	5.18766
	setup	SN (R)	0.31885	0.54738	5.35045

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 ()	0.23258	0.48459	13.33370
	min_pulse_width	RN ()	0.23988	0.48459	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	RN ()	0.23156	0.48237	13.33370
	min_pulse_width	RN ()	0.23519	0.48237	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)	0.05269	0.08697	2.58988
	removal	CK (R)	-0.02021	-0.05936	-0.51121
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.05269	0.08697	2.42812
	removal	CK (R)	-0.02021	-0.05936	-0.51121

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)	0.05269	0.08697	2.58988
	removal	CK (R)	-0.02021	-0.05936	-0.51121
sky130_osu_sc_12T_ms__dffsr_l	recovery	CK (R)	0.05269	0.08697	2.42812
	removal	CK (R)	-0.02021	-0.05936	-0.51121

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 ()	0.29913	0.55996	13.33370
	min_pulse_width	SN ()	0.31092	0.56217	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	SN ()	0.30049	0.54666	13.33370
	min_pulse_width	SN ()	0.29429	0.54666	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 ()	0.22480	0.46020	13.33370
	min_pulse_width	CK ()	0.28019	0.46020	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.21788	0.46020	13.33370
	min_pulse_width	CK ()	0.27673	0.46020	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 ()	0.48295	0.53114	13.33370
	min_pulse_width	CK ()	0.23519	0.46020	13.33370
sky130_osu_sc_12T_ms__dffsr_l	min_pulse_width	CK ()	0.48294	0.53336	13.33370
	min_pulse_width	CK ()	0.23519	0.46020	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	0.00613	0.00538	0.00015
	RN	0.01118	0.01059	0.00471
	SN	-0.00066	-0.03242	-0.43274
	SN	0.01233	0.01174	0.00561
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00566	0.00503	0.00254
	RN	0.01071	0.01024	0.00723
	SN	-0.00066	-0.02632	-0.30584
	SN	0.01186	0.01139	0.00804

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	0.00649	0.00601	0.00295
	RN	-0.00066	-0.03242	-0.43274
	RN	0.01330	0.01286	0.00980
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00599	0.00553	0.00348
	RN	-0.00066	-0.02632	-0.30584
	RN	0.01280	0.01237	0.01029

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	0.00649	0.00601	0.00290
	RN	-0.00066	-0.03258	-0.43642
	RN	0.01330	0.01286	0.00977
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00599	0.00553	0.00346
	RN	-0.00066	-0.02641	-0.30742
	RN	0.01280	0.01237	0.01032

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	0.00610	0.00535	0.00006
	RN	0.01116	0.01057	0.00461
	SN	-0.00066	-0.03258	-0.43640
	SN	0.01231	0.01171	0.00553
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00564	0.00500	0.00257
	RN	0.01068	0.01022	0.00717
	SN	-0.00066	-0.02641	-0.30741
	SN	0.01184	0.01137	0.00806

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	-0.00134	-0.00137	-0.00137
	(!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)	0.00758	0.00729	0.00765
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00262	0.00237	0.00277
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00261	0.00235	0.00276
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00264	0.00238	0.00279
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00133	-0.00137	-0.00137
	(!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)	0.00758	0.00729	0.00765
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00262	0.00237	0.00277
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00261	0.00236	0.00276
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00264	0.00239	0.00279

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	0.00138	0.00137	0.00137
	(!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)	0.01048	0.01031	0.01051
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00491	0.00478	0.00517
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00494	0.00482	0.00519
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00489	0.00477	0.00516
sky130_osu_sc_12T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00138	0.00137	0.00137
	(!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)	0.01048	0.01031	0.01051
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00491	0.00478	0.00518
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00494	0.00482	0.00519
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00489	0.00478	0.00516

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)	0.00167	0.00133	0.00225
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00686	0.00636	0.00720
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)	0.00167	0.00133	0.00226
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.00686	0.00634	0.00720

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)	0.00536	0.00519	0.00653
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01019	0.00986	0.01092
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)	0.00536	0.00519	0.00653
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01019	0.00986	0.01092

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)	-0.00353	-0.00355	-0.00356
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00362	-0.00384	-0.00384
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00343	-0.00357	-0.00356
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00168	0.00138	0.00191
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)	-0.00353	-0.00355	-0.00356
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00362	-0.00384	-0.00385
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00343	-0.00357	-0.00356
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00168	0.00138	0.00191

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)	0.00357	0.00356	0.00357
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00384	0.00386	0.00384
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00356	0.00358	0.00357
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00821	0.00802	0.00826
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)	0.00357	0.00357	0.00357
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00384	0.00386	0.00385
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00357	0.00359	0.00357
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00822	0.00802	0.00826

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)	-0.00032	-0.00077	0.00013
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00367	0.00296	0.00373
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00362	0.00292	0.00369
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00023	-0.00071	0.00025
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00191	0.00110	0.00312
sky130_osu_sc_12T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00032	-0.00077	0.00013
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00367	0.00296	0.00373
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00362	0.00292	0.00369
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00023	-0.00071	0.00025
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00191	0.00110	0.00312

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)	0.01698	0.01641	0.01729
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00778	0.00745	0.00874
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01155	0.01125	0.01222
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01160	0.01125	0.01225
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01647	0.01581	0.01830
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00812	0.00780	0.00907
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01038	0.00984	0.01249
sky130_osu_sc_12T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.01698	0.01641	0.01729
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.00778	0.00745	0.00874
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01155	0.01125	0.01222
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01161	0.01125	0.01225
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.01647	0.01582	0.01830
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00812	0.00780	0.00907
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01038	0.00984	0.01249

SKY130_OSU_SC_12T_MS__DFFSx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00262	0.00514	0.00839	0.81978	0.82238
sky130_osu_sc_12T_ms__dffs_l	0.00262	0.00514	0.00839	0.59219	0.59472

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dffs_1	0.00000	0.18288	0.49849
sky130_osu_sc_12T_ms__dffs_l	0.00000	0.29356	0.60917

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)	0.33159	1.61203	15.51710
	QN->Q (FR)	0.04199	0.95648	12.96170
	SN->Q (FR)	0.25939	1.64798	16.49740
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RR)	0.32844	1.69377	14.84370
	QN->Q (FR)	0.04467	0.96764	12.08480
	SN->Q (FR)	0.25504	1.72468	15.78420

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)	0.51262	1.93621	17.66480
	QN->Q (RF)	0.02888	0.67858	9.31667
sky130_osu_sc_12T_ms__dffs_l	CK->Q (RF)	0.50904	2.06455	17.32260
	QN->Q (RF)	0.03120	0.70167	9.01536

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)	0.45807	1.19367	8.27853
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RR)	0.44784	1.23313	8.07455

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)	0.26982	0.78918	5.11952
	SN->QN (FF)	0.19668	0.82615	6.09838
sky130_osu_sc_12T_ms__dffs_l	CK->QN (RF)	0.26412	0.81468	5.04451
	SN->QN (FF)	0.18999	0.84634	5.98979

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)	-0.06184	-0.09217	-0.46698
	setup	CK (R)	0.23403	0.25678	1.52846
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.06354	-0.09009	-0.46805
	setup	CK (R)	0.23595	0.25798	1.53660

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)	-0.19770	-0.47643	-4.23641
	setup	CK (R)	0.25441	0.49419	4.27678
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.19825	-0.47655	-4.23673
	setup	CK (R)	0.25466	0.49419	4.27678

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)	-0.06184	-0.09217	-0.46698
	setup	CK (R)	0.23403	0.25678	1.52846
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.06354	-0.09009	-0.46805
	setup	CK (R)	0.23595	0.25798	1.53660

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)	-0.19770	-0.47643	-4.23641
	setup	CK (R)	0.25441	0.49419	4.27678
sky130_osu_sc_12T_ms__dffs_l	hold	CK (R)	-0.19825	-0.47655	-4.23673
	setup	CK (R)	0.25466	0.49419	4.27678

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)	0.06319	0.09091	1.84315
	removal	CK (R)	-0.02397	-0.05897	-0.50349
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.06417	0.09491	1.68789
	removal	CK (R)	-0.02397	-0.05897	-0.50349

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)	0.06319	0.09091	1.84315
	removal	CK (R)	-0.02397	-0.05897	-0.50349
sky130_osu_sc_12T_ms__dffs_l	recovery	CK (R)	0.06417	0.09491	1.68789
	removal	CK (R)	-0.02397	-0.05897	-0.50349

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 ()	0.17861	0.49789	13.33370
	min_pulse_width	SN ()	0.18236	0.49789	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	SN ()	0.17265	0.48015	13.33370
	min_pulse_width	SN ()	0.17340	0.48237	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 ()	0.13133	0.46020	13.33370
	min_pulse_width	CK ()	0.26288	0.46020	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.12787	0.46020	13.33370
	min_pulse_width	CK ()	0.25942	0.46020	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 ()	0.34250	0.46020	13.33370
	min_pulse_width	CK ()	0.22134	0.46020	13.33370
sky130_osu_sc_12T_ms__dffs_l	min_pulse_width	CK ()	0.34250	0.46020	13.33370
	min_pulse_width	CK ()	0.22134	0.46020	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	0.00501	0.00420	-0.00074
	SN	-0.00066	-0.03207	-0.42497
	SN	0.01059	0.00989	0.00597
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00451	0.00381	0.00160
	SN	-0.00066	-0.02638	-0.30699
	SN	0.01008	0.00952	0.00826

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	0.00555	0.00498	0.00074
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00505	0.00459	0.00258

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	0.00555	0.00498	0.00072
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00505	0.00459	0.00255

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	0.00499	0.00418	-0.00072
	SN	-0.00066	-0.03213	-0.42630
	SN	0.01056	0.00987	0.00572
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00448	0.00379	0.00143
	SN	-0.00066	-0.02645	-0.30829
	SN	0.01005	0.00949	0.00819

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	-0.00135	-0.00139	-0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00594	0.00562	0.00602
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00240	0.00213	0.00255
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00135	-0.00139	-0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00594	0.00562	0.00603
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00240	0.00214	0.00255

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	0.00141	0.00140	0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00899	0.00879	0.00911
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00451	0.00437	0.00479
sky130_osu_sc_12T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00141	0.00140	0.00139
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00899	0.00880	0.00911
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00451	0.00439	0.00479

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)	-0.00261	-0.00263	-0.00262
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00173	0.00142	0.00266
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)	-0.00261	-0.00263	-0.00262
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00173	0.00142	0.00266

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)	0.00264	0.00264	0.00263
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00576	0.00551	0.00770
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)	0.00264	0.00264	0.00263
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00577	0.00551	0.00770

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)	-0.00028	-0.00073	0.00018
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00027	-0.00075	0.00022
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00174	0.00094	0.00301
sky130_osu_sc_12T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00028	-0.00073	0.00018
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00027	-0.00075	0.00022
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00174	0.00094	0.00301

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)	0.01521	0.01463	0.01553
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00765	0.00733	0.00861
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01485	0.01416	0.01675
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00807	0.00776	0.00902
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00983	0.00929	0.01202
sky130_osu_sc_12T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.01521	0.01464	0.01553
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.00765	0.00733	0.00861
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.01485	0.01416	0.01675
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.00807	0.00777	0.00902
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00983	0.00929	0.01202

SKY130_OSU_SC_12T_MS__DFFx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00277	0.00822	0.76231
sky130_osu_sc_12T_ms__dff_l	0.00277	0.00822	0.56361

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__dff_1	0.00000	0.03097	0.03804
sky130_osu_sc_12T_ms__dff_l	0.00000	0.14165	0.14872

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)**	0.28645	1.01418	7.94669
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RR)**	0.28263	1.05934	7.74600

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)**	0.43015	0.94059	5.15425
sky130_osu_sc_12T_ms__dff_l	**CK->Q (RF)**	0.42776	0.97623	5.18099

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)	-0.06670	-0.09488	-0.53155
	setup	CK (R)	0.19437	0.21783	1.53316
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.06352	-0.09485	-0.53147
	setup	CK (R)	0.19715	0.21982	1.53826

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)	-0.18181	-0.47622	-4.27011
	setup	CK (R)	0.21863	0.49459	4.31015
sky130_osu_sc_12T_ms__dff_l	hold	CK (R)	-0.18162	-0.47575	-4.27159
	setup	CK (R)	0.21863	0.49459	4.31014

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 ()	0.12441	0.46020	13.33370
	min_pulse_width	CK ()	0.24557	0.46020	13.33370
sky130_osu_sc_12T_ms__dff_l	min_pulse_width	CK ()	0.12094	0.46020	13.33370
	min_pulse_width	CK ()	0.24211	0.46020	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 ()**	0.30096	0.46020	13.33370
	min_pulse_width	**CK ()**	0.17980	0.46020	13.33370
sky130_osu_sc_12T_ms__dff_l	**min_pulse_width**	**CK ()**	0.30096	0.46020	13.33370
	min_pulse_width	**CK ()**	0.17980	0.46020	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	0.01055	0.00956	0.01143
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00951	0.00854	0.01045

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	0.01135	0.01072	0.01145
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01033	0.00971	0.01044

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	-0.00115	-0.00134	-0.00135
	!CK	0.00000	0.00000	0.00000
	!CK	0.00543	0.00510	0.00543
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00115	-0.00134	-0.00135
	!CK	0.00000	0.00000	0.00000
	!CK	0.00543	0.00510	0.00543

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	0.00134	0.00135	0.00135
	!CK	0.00000	0.00000	0.00000
	!CK	0.00933	0.00910	0.00942
sky130_osu_sc_12T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00134	0.00135	0.00135
	!CK	0.00000	0.00000	0.00000
	!CK	0.00933	0.00910	0.00942

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)	-0.00030	-0.00075	0.00016
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00027	-0.00075	0.00022
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	-0.00030	-0.00075	0.00016
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	-0.00027	-0.00075	0.00022

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)	0.00762	0.00731	0.00859
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01467	0.01411	0.01502
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01508	0.01435	0.01699
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00802	0.00770	0.00898
sky130_osu_sc_12T_ms__dff_l	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	0.00762	0.00731	0.00859
	(D * !Q)	0.00000	0.00000	0.00000
	(D * !Q)	0.01467	0.01411	0.01502
	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	0.01508	0.01435	0.01699
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	0.00802	0.00770	0.00898

SKY130_OSU_SC_12T_MS__INVx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00268	0.75831
sky130_osu_sc_12T_ms__inv_10	0.02383	7.63837
sky130_osu_sc_12T_ms__inv_2	0.00496	1.56804
sky130_osu_sc_12T_ms__inv_3	0.00734	2.30371
sky130_osu_sc_12T_ms__inv_4	0.00965	3.11188
sky130_osu_sc_12T_ms__inv_6	0.01445	4.64111
sky130_osu_sc_12T_ms__inv_8	0.01914	6.17874
sky130_osu_sc_12T_ms__inv_l	0.00213	0.54311

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__inv_1	0.00000	0.00464	0.00907
sky130_osu_sc_12T_ms__inv_10	0.00000	0.04643	0.09073
sky130_osu_sc_12T_ms__inv_2	0.00000	0.00929	0.01815
sky130_osu_sc_12T_ms__inv_3	0.00000	0.01393	0.02722
sky130_osu_sc_12T_ms__inv_4	0.00000	0.01857	0.03629
sky130_osu_sc_12T_ms__inv_6	0.00000	0.02786	0.05444
sky130_osu_sc_12T_ms__inv_8	0.00000	0.03714	0.07259
sky130_osu_sc_12T_ms__inv_l	0.00000	0.05998	0.11987

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)**	0.04075	0.89625	11.95170
sky130_osu_sc_12T_ms__inv_10	**A->Y (FR)**	0.04134	0.58844	11.96620
sky130_osu_sc_12T_ms__inv_2	**A->Y (FR)**	0.02930	0.75720	11.92960
sky130_osu_sc_12T_ms__inv_3	**A->Y (FR)**	0.03076	0.70379	11.94410
sky130_osu_sc_12T_ms__inv_4	**A->Y (FR)**	0.02962	0.66727	11.93310
sky130_osu_sc_12T_ms__inv_6	**A->Y (FR)**	0.03204	0.62343	11.93610
sky130_osu_sc_12T_ms__inv_8	**A->Y (FR)**	0.03624	0.60183	11.96120
sky130_osu_sc_12T_ms__inv_l	**A->Y (FR)**	0.04494	0.91667	11.23080

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)**	0.02665	0.61685	8.38633
sky130_osu_sc_12T_ms__inv_10	**A->Y (RF)**	0.03165	0.43364	8.63778
sky130_osu_sc_12T_ms__inv_2	**A->Y (RF)**	0.02084	0.54955	8.53321
sky130_osu_sc_12T_ms__inv_3	**A->Y (RF)**	0.02212	0.51982	8.60921
sky130_osu_sc_12T_ms__inv_4	**A->Y (RF)**	0.02148	0.49370	8.62612
sky130_osu_sc_12T_ms__inv_6	**A->Y (RF)**	0.02453	0.46659	8.65046
sky130_osu_sc_12T_ms__inv_8	**A->Y (RF)**	0.02792	0.44799	8.67203
sky130_osu_sc_12T_ms__inv_l	**A->Y (RF)**	0.02992	0.64866	8.23159

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	0.00246	0.00240	0.00260
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.01997	0.02036	0.02251
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00421	0.00422	0.00462
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.00648	0.00608	0.00710
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.00822	0.00830	0.00912
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.01217	0.01180	0.01364
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.01610	0.01635	0.01811
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00194	0.00194	0.00220

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	-0.00035	-0.00039	-0.00035
sky130_osu_sc_12T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.00690	-0.00667	-0.00534
sky130_osu_sc_12T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00126	-0.00129	-0.00114
sky130_osu_sc_12T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00162	-0.00167	-0.00140
sky130_osu_sc_12T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00259	-0.00257	-0.00219
sky130_osu_sc_12T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00394	-0.00392	-0.00326
sky130_osu_sc_12T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.00538	-0.00534	-0.00431
sky130_osu_sc_12T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00026	-0.00028	-0.00025

SKY130_OSU_SC_12T_MS__MUX2

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.07080	0.07069	0.00553	0.06686

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__mux2_1	0.00000	0.00938	0.00938

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)	-	0.01968	0.34114	3.31507
	A1->Y (RR)	-	0.02373	0.34405	3.31924
	S0->Y (RR)	(!A0 * A1)	0.06446	0.34997	1.26787
	S0->Y (FR)	(A0 * !A1)	0.04269	0.45857	3.28865

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)	-	0.02155	0.30186	2.81134
	A1->Y (FF)	-	0.01865	0.29860	2.80662
	S0->Y (FF)	(!A0 * A1)	0.09209	0.43561	2.23954
	S0->Y (RF)	(A0 * !A1)	0.02894	0.33242	2.22361

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	-	-0.00242	-0.00243	-0.00242
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00159	-0.00160	-0.00159
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00330	0.00312	0.00465
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00149	-0.00187	-0.00067

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	-	0.00242	0.00243	0.00243
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00159	0.00160	0.00160
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00049	0.00010	0.00136
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.00657	0.00637	0.00779

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)	-0.00060	-0.00060	-0.00060

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)	0.00060	0.00060	0.00060

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)	-0.00072	-0.00072	-0.00072

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)	0.00072	0.00072	0.00072

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)	-0.00052	-0.00090	0.00035
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00050	-0.00088	0.00034

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)	0.00510	0.00487	0.00635
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00477	0.00456	0.00611

SKY130_OSU_SC_12T_MS__NAND2x

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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_1	6.34920

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_12T_ms__nand2_1	0.00267	0.00266	0.75453
sky130_osu_sc_12T_ms__nand2_1	0.00208	0.00210	0.54139

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.00465	0.01815
sky130_osu_sc_12T_ms__nand2_1	0.00000	0.06000	0.23973

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)	0.04253	0.89747	11.95310
	B->Y (FR)	0.04812	0.87299	11.53020
sky130_osu_sc_12T_ms__nand2_l	A->Y (FR)	0.04536	0.91524	11.22990
	B->Y (FR)	0.05358	0.92486	11.21940

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)	0.04189	0.80767	10.64020
	B->Y (RF)	0.04745	0.80178	10.39920
sky130_osu_sc_12T_ms__nand2_l	A->Y (RF)	0.04618	0.85571	10.40270
	B->Y (RF)	0.05138	0.84991	10.11900

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	0.00259	0.00244	0.00272
	B	0.00000	0.00000	0.00000
	B	0.00326	0.00321	0.00334
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00195	0.00181	0.00218
	B	0.00000	0.00000	0.00000
	B	0.00242	0.00240	0.00264

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	-0.00021	-0.00026	-0.00022
	B	0.00000	0.00000	0.00000
	B	-0.00019	-0.00025	-0.00023
sky130_osu_sc_12T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00013	-0.00017	-0.00014
	B	0.00000	0.00000	0.00000
	B	-0.00012	-0.00017	-0.00015

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)	-0.00160	-0.00160	-0.00161
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00114	-0.00113	-0.00114

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)	0.00161	0.00163	0.00162
sky130_osu_sc_12T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00114	0.00117	0.00115

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)	-0.00147	-0.00148	-0.00148
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00106	-0.00106	-0.00106

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)	0.00149	0.00148	0.00148
sky130_osu_sc_12T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00107	0.00106	0.00107

SKY130_OSU_SC_12T_MS__NOR2x

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00263	0.00290	0.38504
sky130_osu_sc_12T_ms__nor2_l	0.00199	0.00221	0.28598

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__nor2_1	0.00000	0.00370	0.00907
sky130_osu_sc_12T_ms__nor2_l	0.00000	0.04071	0.11986

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)	0.09614	1.11332	11.80290
	B->Y (FR)	0.07891	1.08282	11.76050
sky130_osu_sc_12T_ms__nor2_l	A->Y (FR)	0.09906	1.16514	11.41450
	B->Y (FR)	0.08570	1.11823	11.11710

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)	0.03402	0.52623	6.21949
	B->Y (RF)	0.02828	0.51865	6.20352
sky130_osu_sc_12T_ms__nor2_l	A->Y (RF)	0.03602	0.55215	6.17107
	B->Y (RF)	0.03113	0.54488	6.15694

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	0.00333	0.00327	0.00329
	B	0.00000	0.00000	0.00000
	B	0.00271	0.00264	0.00278
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00242	0.00239	0.00243
	B	0.00000	0.00000	0.00000
	B	0.00204	0.00200	0.00243

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	0.00039	0.00027	0.00031
	B	0.00000	0.00000	0.00000
	B	-0.00027	-0.00030	-0.00027
sky130_osu_sc_12T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00029	0.00021	0.00027
	B	0.00000	0.00000	0.00000
	B	-0.00017	-0.00019	-0.00015

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)	-0.00116	-0.00136	-0.00136
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00075	-0.00092	-0.00093

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)	0.00136	0.00137	0.00136
sky130_osu_sc_12T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00094	0.00094	0.00094

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)	-0.00070	-0.00070	-0.00070
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00049	-0.00049	-0.00049

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)	0.00074	0.00075	0.00071
sky130_osu_sc_12T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00052	0.00052	0.00050

SKY130_OSU_SC_12T_MS__OAI21

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00266	0.00276	0.00237	0.38429

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai21_l	0.00000	0.04688	0.12894

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)	0.10961	1.11563	11.80480
	A1->Y (FR)	0.13138	1.15273	11.85090
	B0->Y (FR)	0.05705	0.81907	9.33873

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)	0.05696	0.65873	7.30629
	A1->Y (RF)	0.06671	0.65720	7.22005
	B0->Y (RF)	0.04519	0.66810	7.73477

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	0.00367	0.00359	0.00371
	A1	0.00000	0.00000	0.00000
	A1	0.00435	0.00427	0.00427
	B0	0.00294	0.00291	0.00328

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	0.00022	0.00018	0.00017
	A1	0.00000	0.00000	0.00000
	A1	0.00091	0.00078	0.00078
	B0	0.00116	0.00110	0.00114

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)	-0.00071	-0.00071	-0.00070
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00136	-0.00139	-0.00138
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00141	-0.00142	-0.00142

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)	0.00075	0.00075	0.00072
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00138	0.00139	0.00138
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00142	0.00143	0.00142

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)	-0.00111	-0.00132	-0.00131
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00134	-0.00138	-0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00139	-0.00140	-0.00140

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)	0.00131	0.00132	0.00131
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00137	0.00139	0.00137
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00139	0.00140	0.00140

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)	-0.00119	-0.00119	-0.00122

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)	0.00123	0.00123	0.00123

SKY130_OSU_SC_12T_MS__OAI22

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00249	0.00262	0.00281	0.00277	0.40398

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__oai22_1	0.00000	0.00555	0.01815

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)	0.14005	1.15822	11.96140
	A1->Y (FR)	0.12219	1.12466	11.92680
	B0->Y (FR)	0.08302	1.08453	11.88950
	B1->Y (FR)	0.10270	1.11775	11.92330

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)	0.08763	0.70882	7.55374
	A1->Y (RF)	0.07270	0.68917	7.50989
	B0->Y (RF)	0.06144	0.69802	7.94012
	B1->Y (RF)	0.07723	0.71663	7.99654

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	0.00549	0.00543	0.00543
	A1	0.00481	0.00474	0.00485
	B0	0.00352	0.00347	0.00357
	B1	0.00424	0.00418	0.00417

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_12T_ms__oai22_l	A0	0.00134	0.00122	0.00121
	A1	0.00070	0.00066	0.00064
	B0	0.00069	0.00064	0.00065
	B1	0.00134	0.00121	0.00123

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)	-0.00114	-0.00133	-0.00133
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00114	-0.00133	-0.00133
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00130	-0.00133	-0.00133
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00135	-0.00136	-0.00135

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)	0.00133	0.00135	0.00133
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00133	0.00135	0.00133
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00132	0.00134	0.00133
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00135	0.00137	0.00136

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)	-0.00068	-0.00069	-0.00068
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00068	-0.00069	-0.00068
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00130	-0.00132	-0.00132
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00134	-0.00135	-0.00135

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)	0.00072	0.00073	0.00070
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00072	0.00073	0.00070
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00131	0.00132	0.00132
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00135	0.00137	0.00135

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)	-0.00069	-0.00070	-0.00069
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00069	-0.00070	-0.00069
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00154	-0.00157	-0.00157
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00154	-0.00155	-0.00159

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)	0.00073	0.00074	0.00070
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00073	0.00073	0.00070
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00157	0.00157	0.00157
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00160	0.00160	0.00160

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)	-0.00113	-0.00132	-0.00132
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00113	-0.00131	-0.00132
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00157	-0.00161	-0.00161
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00156	-0.00158	-0.00162

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)	0.00132	0.00133	0.00132
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00132	0.00134	0.00132
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00161	0.00161	0.00161
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00163	0.00165	0.00163

SKY130_OSU_SC_12T_MS__OR2x

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00298	0.00275	0.76908
sky130_osu_sc_12T_ms__or2_2	0.00298	0.00275	1.58447
sky130_osu_sc_12T_ms__or2_4	0.00299	0.00275	3.15931
sky130_osu_sc_12T_ms__or2_8	0.00297	0.00275	6.12691
sky130_osu_sc_12T_ms__or2_l	0.00225	0.00210	0.55952

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__or2_1	0.00000	0.00613	0.00950
sky130_osu_sc_12T_ms__or2_2	0.00000	0.00856	0.01857
sky130_osu_sc_12T_ms__or2_4	0.00000	0.01341	0.03672
sky130_osu_sc_12T_ms__or2_8	0.00000	0.02312	0.07301
sky130_osu_sc_12T_ms__or2_l	0.00000	0.07075	0.12007

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)	0.09248	0.82785	7.81185
	B->Y (RR)	0.08307	0.79523	7.65412
sky130_osu_sc_12T_ms__or2_2	A->Y (RR)	0.09782	0.72717	7.98371
	B->Y (RR)	0.08794	0.70123	7.85177
sky130_osu_sc_12T_ms__or2_4	A->Y (RR)	0.12689	0.70428	8.41420
	B->Y (RR)	0.11668	0.68300	8.30731
sky130_osu_sc_12T_ms__or2_8	A->Y (RR)	0.18444	0.74003	8.87611
	B->Y (RR)	0.17407	0.72423	8.78897
sky130_osu_sc_12T_ms__or2_l	A->Y (RR)	0.09561	0.87179	7.55109
	B->Y (RR)	0.08680	0.84378	7.44223

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)	0.18680	0.79752	6.27128
	B->Y (FF)	0.15987	0.75660	5.93487
sky130_osu_sc_12T_ms__or2_2	A->Y (FF)	0.22683	0.80603	6.75589
	B->Y (FF)	0.19984	0.77232	6.41983
sky130_osu_sc_12T_ms__or2_4	A->Y (FF)	0.32461	0.89695	7.41966
	B->Y (FF)	0.29791	0.86218	7.13221
sky130_osu_sc_12T_ms__or2_8	A->Y (FF)	0.51922	1.10861	8.13152
	B->Y (FF)	0.49268	1.06992	7.93717
sky130_osu_sc_12T_ms__or2_l	A->Y (FF)	0.19062	0.81611	5.87117
	B->Y (FF)	0.16634	0.76543	5.49027

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	0.00269	0.00236	0.00313
	B	0.00000	0.00000	0.00000
	B	0.00203	0.00177	0.00287
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00439	0.00422	0.00498
	B	0.00000	0.00000	0.00000
	B	0.00370	0.00366	0.00476
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.00826	0.00840	0.00908
	B	0.00000	0.00000	0.00000
	B	0.00755	0.00786	0.00881
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01596	0.01660	0.01794
	B	0.00000	0.00000	0.00000
	B	0.01522	0.01598	0.01770
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00206	0.00183	0.00265
	B	0.00000	0.00000	0.00000
	B	0.00159	0.00144	0.00288

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	0.00575	0.00557	0.00594
	B	0.00000	0.00000	0.00000
	B	0.00488	0.00483	0.00614
sky130_osu_sc_12T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00699	0.00708	0.00740
	B	0.00000	0.00000	0.00000
	B	0.00612	0.00631	0.00754
sky130_osu_sc_12T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01008	0.01065	0.01103
	B	0.00000	0.00000	0.00000
	B	0.00918	0.00979	0.01102
sky130_osu_sc_12T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.01665	0.01757	0.01838
	B	0.00000	0.00000	0.00000
	B	0.01562	0.01670	0.01828
sky130_osu_sc_12T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00429	0.00417	0.00491
	B	0.00000	0.00000	0.00000
	B	0.00369	0.00376	0.00602

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)	-0.00118	-0.00138	-0.00138
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00118	-0.00138	-0.00138
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00118	-0.00138	-0.00138
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00118	-0.00138	-0.00138
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00076	-0.00092	-0.00094

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)	0.00137	0.00138	0.00138
sky130_osu_sc_12T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00137	0.00139	0.00138
sky130_osu_sc_12T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00137	0.00139	0.00138
sky130_osu_sc_12T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00137	0.00139	0.00138
sky130_osu_sc_12T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00094	0.00094	0.00094

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)	-0.00071	-0.00071	-0.00070
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00071	-0.00071	-0.00070
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00071	-0.00071	-0.00070
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00071	-0.00071	-0.00070
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00048	-0.00048	-0.00048

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)	0.00075	0.00076	0.00072
sky130_osu_sc_12T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00075	0.00076	0.00072
sky130_osu_sc_12T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00075	0.00076	0.00072
sky130_osu_sc_12T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00075	0.00076	0.00072
sky130_osu_sc_12T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00051	0.00052	0.00049

SKY130_OSU_SC_12T_MS__TBUFIx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00288	0.00378	0.39630
sky130_osu_sc_12T_ms__tbufi_l	0.00222	0.00290	0.28209

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tbufi_1	0.00000	0.00480	0.01815
sky130_osu_sc_12T_ms__tbufi_l	0.00000	0.06007	0.23973

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)	0.07251	1.06778	11.74320
	OE->Y (FR)	0.06031	0.32054	4.28299
	OE->Y (RR)	0.11480	0.97919	7.70005
sky130_osu_sc_12T_ms__tbufi_l	A->Y (FR)	0.08200	1.10945	11.02420
	OE->Y (FR)	0.05937	0.29075	4.28298
	OE->Y (RR)	0.12092	1.04857	7.53438

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)	0.04089	0.64775	7.60349
	OE->Y (FF)	0.06134	0.32246	4.28300
	OE->Y (RF)	0.03920	0.63273	7.30132
sky130_osu_sc_12T_ms__tbufi_l	A->Y (RF)	0.04562	0.67983	7.41547
	OE->Y (FF)	0.06058	0.29075	4.28298
	OE->Y (RF)	0.04300	0.66195	7.07423

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	0.00250	0.00244	0.00257
	OE	0.00000	0.00000	0.00000
	OE	0.00239	0.00204	0.00333
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00190	0.00187	0.00225
	OE	0.00000	0.00000	0.00000
	OE	0.00175	0.00151	0.00358

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	-0.00028	-0.00031	-0.00027
	OE	0.00000	0.00000	0.00000
	OE	0.00155	0.00121	0.00255
sky130_osu_sc_12T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00017	-0.00019	-0.00015
	OE	0.00000	0.00000	0.00000
	OE	0.00109	0.00085	0.00310

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)	-0.00118	-0.00119	-0.00119
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00107	-0.00109	-0.00107
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00085	-0.00086	-0.00086
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00077	-0.00079	-0.00078

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)	0.00118	0.00119	0.00119
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00111	0.00112	0.00109
sky130_osu_sc_12T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00085	0.00086	0.00086
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00080	0.00081	0.00079

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)	0.00090	0.00056	0.00191
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00080	0.00044	0.00179
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00064	0.00041	0.00267
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00055	0.00031	0.00256

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)	0.00301	0.00274	0.00423
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00306	0.00281	0.00429
sky130_osu_sc_12T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00231	0.00221	0.00484
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00232	0.00225	0.00488

SKY130_OSU_SC_12T_MS__TNBUFIx

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00287	0.00422	0.39640
sky130_osu_sc_12T_ms__tnbufi_l	0.00212	0.00321	0.28228

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__tnbufi_1	0.00000	0.00775	0.00929
sky130_osu_sc_12T_ms__tnbufi_l	0.00000	0.09999	0.11998

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)	0.07321	1.06781	11.74490
	OE->Y (RR)	0.03240	0.29059	4.28327
	OE->Y (FR)	0.08486	1.09207	11.77800
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (FR)	0.08054	1.10756	11.02570
	OE->Y (RR)	0.03513	0.29034	4.28297
	OE->Y (FR)	0.09011	1.15092	11.32170

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)	0.03992	0.64737	7.60410
	OE->Y (RF)	0.03199	0.29058	4.28326
	OE->Y (FF)	0.08116	0.65009	4.91123
sky130_osu_sc_12T_ms__tnbufi_l	A->Y (RF)	0.04333	0.67935	7.41641
	OE->Y (RF)	0.03479	0.29035	4.28297
	OE->Y (FF)	0.08706	0.65751	4.42981

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	0.00260	0.00253	0.00266
	OE	0.00000	0.00000	0.00000
	OE	0.00609	0.00598	0.00769
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00195	0.00192	0.00230
	OE	0.00000	0.00000	0.00000
	OE	0.00464	0.00463	0.00746

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	-0.00040	-0.00042	-0.00039
	OE	0.00000	0.00000	0.00000
	OE	0.00534	0.00523	0.00684
sky130_osu_sc_12T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00030	-0.00031	-0.00028
	OE	0.00000	0.00000	0.00000
	OE	0.00407	0.00408	0.00681

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)	-0.00097	-0.00098	-0.00097
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00087	-0.00089	-0.00087
sky130_osu_sc_12T_ms__tnbufi_l	(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)	-0.00059	-0.00060	-0.00059

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)	0.00097	0.00098	0.00097
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00090	0.00091	0.00088
sky130_osu_sc_12T_ms__tnbufi_l	(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)	0.00062	0.00062	0.00061

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)	-0.00147	-0.00198	-0.00058
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00147	-0.00192	-0.00057
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00098	-0.00137	0.00096
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00102	-0.00136	0.00096

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)	0.00460	0.00450	0.00613
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00451	0.00443	0.00607
sky130_osu_sc_12T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00354	0.00358	0.00634
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00349	0.00352	0.00628

SKY130_OSU_SC_12T_MS__XNOR2

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00575	0.00487	0.40988

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xnor2_l	0.00000	0.01647	0.02743

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	0.14793	1.03452	8.01317
	A->Y (FR)	!B	0.09707	1.10004	11.91290
	B->Y (RR)	A	0.12234	1.00596	7.95349
	B->Y (FR)	!A	0.11612	1.12847	11.93890

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	0.13088	0.74696	5.36043
	A->Y (RF)	!B	0.05611	0.65383	7.43860
	B->Y (FF)	A	0.11701	0.73215	5.34702
	B->Y (RF)	!A	0.06587	0.66700	7.45260

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	0.00256	0.00216	0.00330
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00638	0.00610	0.00775
	B	A	0.00000	0.00000	0.00000
	B	A	0.00128	0.00103	0.00228
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00661	0.00639	0.00799

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	0.00746	0.00711	0.00849
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00172	0.00132	0.00258
	B	A	0.00000	0.00000	0.00000
	B	A	0.00670	0.00660	0.00813
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00229	0.00186	0.00312

SKY130_OSU_SC_12T_MS__XOR2

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.00578	0.00491	0.38385

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_12T_ms__xor2_l	0.00000	0.01647	0.02789

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	0.15538	1.03679	7.86626
	A->Y (FR)	B	0.11876	1.13029	11.81120
	B->Y (RR)	!A	0.12873	1.01815	7.84515
	B->Y (FR)	A	0.12899	1.14411	11.81890

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	0.12969	0.73355	5.16714
	A->Y (RF)	B	0.05636	0.66452	7.51423
	B->Y (FF)	!A	0.12161	0.72581	5.13098
	B->Y (RF)	A	0.06314	0.65408	7.21216

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	0.00729	0.00702	0.00858
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00167	0.00102	0.00218
	B	A	0.00000	0.00000	0.00000
	B	A	0.00735	0.00714	0.00872
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00122	0.00092	0.00218

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	0.00151	0.00100	0.00224
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00774	0.00755	0.00899
	B	A	0.00000	0.00000	0.00000
	B	A	0.00153	0.00108	0.00232
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00679	0.00673	0.00823

SKY130_OSU_SC_12T_MS_x

sky130_osu_sc_12T_ms_tt_1P44_25C.ccs
Cell Library: Process , Voltage 1.44,
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	0.19305
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	70352.50000	140705.00000
sky130_osu_sc_12T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_12T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	-0.00119	0.01337	0.20388

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_12T_ms__ant	0.00000	0.00000	0.00000
	1.22507	1.16197	0.25900