sky130_osu_sc_15T_ms_TT_1P8_25C.ccs Library

Cell Groups
SKY130_OSU_SC_15T_MS__ADDFx
SKY130_OSU_SC_15T_MS__ADDHx
SKY130_OSU_SC_15T_MS__AND2x
SKY130_OSU_SC_15T_MS__AOI21
SKY130_OSU_SC_15T_MS__AOI22
SKY130_OSU_SC_15T_MS__BUFx
SKY130_OSU_SC_15T_MS__DFFRx
SKY130_OSU_SC_15T_MS__DFFSRx
SKY130_OSU_SC_15T_MS__DFFSx
SKY130_OSU_SC_15T_MS__DFFx
SKY130_OSU_SC_15T_MS__INVx
SKY130_OSU_SC_15T_MS__MUX2
SKY130_OSU_SC_15T_MS__NAND2x
SKY130_OSU_SC_15T_MS__NOR2x
SKY130_OSU_SC_15T_MS__OAI21
SKY130_OSU_SC_15T_MS__OAI22
SKY130_OSU_SC_15T_MS__OR2x
SKY130_OSU_SC_15T_MS__TBUFIx
SKY130_OSU_SC_15T_MS__TNBUFIx
SKY130_OSU_SC_15T_MS__XNOR2
SKY130_OSU_SC_15T_MS__XOR2
SKY130_OSU_SC_15T_MS_x

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	**B**	**CI**	**CO**	**CON**	**S**
sky130_osu_sc_15T_ms__addf_1	0.01554	0.01550	0.01193	0.14985	0.05889	0.14270
sky130_osu_sc_15T_ms__addf_l	0.01554	0.01550	0.01191	0.09037	0.05985	0.09229

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.39194	0.51301
sky130_osu_sc_15T_ms__addf_l	0.00000	0.24752	0.36859

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.13795	0.44068	1.97945
	B->CO (RR)	0.13347	0.42576	1.90710
	CI->CO (RR)	0.13039	0.43938	2.00900
	CON->CO (FR)	0.02373	0.15448	0.80386
sky130_osu_sc_15T_ms__addf_l	A->CO (RR)	0.14311	0.41447	1.54694
	B->CO (RR)	0.13858	0.40296	1.51230
	CI->CO (RR)	0.13553	0.41333	1.57885
	CON->CO (FR)	0.03010	0.17610	0.81228

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.18438	0.56193	2.46042
	B->CO (FF)	0.16348	0.52800	2.35114
	CI->CO (FF)	0.16211	0.53791	2.45232
	CON->CO (RF)	0.02226	0.13682	0.70806
sky130_osu_sc_15T_ms__addf_l	A->CO (FF)	0.17865	0.48685	1.75259
	B->CO (FF)	0.15868	0.45801	1.68282
	CI->CO (FF)	0.15637	0.46309	1.74696
	CON->CO (RF)	0.02392	0.13488	0.62196

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (FR)	0.13683	0.27402	0.78616
	B->CON (FR)	0.11863	0.24607	0.75523
	CI->CON (FR)	0.11462	0.25017	0.78380
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.12942	0.26758	0.78566
	B->CON (FR)	0.11178	0.24016	0.75472
	CI->CON (FR)	0.10723	0.24379	0.78327

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CON (RF)	0.09058	0.18806	0.56198
	B->CON (RF)	0.08757	0.18614	0.57754
	CI->CON (RF)	0.08297	0.18690	0.59774
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.08663	0.18482	0.56254
	B->CON (RF)	0.08388	0.18316	0.57805
	CI->CON (RF)	0.07900	0.18370	0.59828

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-R)	0.26777	0.60364	2.12289
	B->S (-R)	0.27684	0.61037	2.10180
	CI->S (-R)	0.24377	0.57713	2.11132
	CON->S (RR)	0.07552	0.20280	0.69508
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.25784	0.55293	1.71617
	B->S (-R)	0.26717	0.56196	1.71553
	CI->S (-R)	0.24943	0.54381	1.70948
	CON->S (RR)	0.07748	0.21331	0.68066

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->S (-F)	0.22783	0.51244	1.72132
	B->S (-F)	0.22783	0.49502	1.66588
	CI->S (-F)	0.21956	0.50922	1.74837
	CON->S (FF)	0.09223	0.22720	0.71914
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.21341	0.45741	1.35428
	B->S (-F)	0.21363	0.44225	1.31853
	CI->S (-F)	0.20510	0.45431	1.38354
	CON->S (FF)	0.08745	0.21920	0.64775

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00372	0.00364	0.00417
	B	0.00481	0.00480	0.00543
	CI	0.00492	0.00514	0.00596
sky130_osu_sc_15T_ms__addf_l	A	0.00287	0.00267	0.00289
	B	0.00396	0.00384	0.00407
	CI	0.00406	0.00416	0.00455

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01354	0.01366	0.01428
	B	0.01331	0.01357	0.01430
	CI	0.01173	0.01214	0.01295
sky130_osu_sc_15T_ms__addf_l	A	0.01272	0.01275	0.01299
	B	0.01247	0.01265	0.01297
	CI	0.01089	0.01121	0.01168

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01351	0.01352	0.01367
	B	0.01327	0.01341	0.01355
	CI	0.01170	0.01194	0.01228
sky130_osu_sc_15T_ms__addf_l	A	0.01271	0.01270	0.01282
	B	0.01246	0.01259	0.01271
	CI	0.01087	0.01110	0.01144

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00367	0.00349	0.00364
	B	0.00475	0.00465	0.00473
	CI	0.00489	0.00499	0.00529
sky130_osu_sc_15T_ms__addf_l	A	0.00283	0.00261	0.00270
	B	0.00391	0.00376	0.00380
	CI	0.00405	0.00410	0.00435

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01353	0.01360	0.01424
	B	0.01331	0.01356	0.01421
	CI	0.01172	0.01213	0.01289
sky130_osu_sc_15T_ms__addf_l	A	0.01272	0.01275	0.01300
	B	0.01247	0.01265	0.01299
	CI	0.01089	0.01122	0.01169

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02807	0.02818	0.02837
	B	0.02512	0.02467	0.02554
	CI	0.02285	0.02266	0.02283
sky130_osu_sc_15T_ms__addf_l	A	0.02693	0.02686	0.02693
	B	0.02398	0.02351	0.02451
	CI	0.02171	0.02152	0.02172

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00761	0.00842	0.14714	0.06790	0.15011
sky130_osu_sc_15T_ms__addh_l	0.00761	0.00842	0.09452	0.06894	0.09614

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.44594	0.51277
sky130_osu_sc_15T_ms__addh_l	0.00000	0.26535	0.36835

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.09216	0.21936	0.71923
	B->CO (RR)	0.09567	0.21874	0.71439
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.09574	0.23264	0.70900
	B->CO (RR)	0.09922	0.23125	0.70548

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (FF)	0.07799	0.20404	0.69064
	B->CO (FF)	0.08344	0.21117	0.70595
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.07414	0.19003	0.57384
	B->CO (FF)	0.07933	0.19680	0.58864

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (RR)	B	0.12686	0.21429	0.48116
	A->CON (FR)	!B	0.07410	0.21063	0.76678
	B->CON (RR)	A	0.13005	0.21303	0.47497
	B->CON (FR)	!A	0.09131	0.22910	0.77152
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.11685	0.20481	0.46723
	A->CON (FR)	!B	0.06742	0.20426	0.76638
	B->CON (RR)	A	0.12004	0.20327	0.46270
	B->CON (FR)	!A	0.08459	0.22304	0.77141

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CON (FF)	B	0.12298	0.23637	0.60322
	A->CON (RF)	!B	0.05314	0.15994	0.59867
	B->CON (FF)	A	0.12082	0.24034	0.62930
	B->CON (RF)	!A	0.06440	0.16855	0.59263
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.11424	0.22701	0.58924
	A->CON (RF)	!B	0.04947	0.15670	0.59930
	B->CON (FF)	A	0.11203	0.23117	0.61553
	B->CON (RF)	!A	0.06080	0.16551	0.59331

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (RR)	!B	0.09555	0.39615	1.93817
	A->S (FR)	B	0.16609	0.46818	1.92538
	B->S (RR)	!A	0.10720	0.39732	1.88241
	B->S (FR)	A	0.16413	0.47946	2.00185
	CON->S (FR)	-	0.02595	0.15922	0.82298
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.09720	0.37046	1.55972
	A->S (FR)	B	0.16291	0.43717	1.53665
	B->S (RR)	!A	0.10901	0.37396	1.52507
	B->S (FR)	A	0.16074	0.44642	1.59258
	CON->S (FR)	-	0.03044	0.17801	0.83274

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->S (FF)	!B	0.11418	0.46032	2.24812
	A->S (RF)	B	0.16112	0.39794	1.51741
	B->S (FF)	!A	0.13135	0.47895	2.25918
	B->S (RF)	A	0.16430	0.39595	1.51067
	CON->S (RF)	-	0.02101	0.13324	0.69348
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.10844	0.40087	1.67793
	A->S (RF)	B	0.15182	0.35802	1.15596
	B->S (FF)	!A	0.12570	0.41907	1.68561
	B->S (RF)	A	0.15504	0.35620	1.15015
	CON->S (RF)	-	0.02261	0.13459	0.63438

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00594	0.00568	0.00588
	B	0.00000	0.00000	0.00000
	B	0.00537	0.00518	0.00516
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00513	0.00492	0.00505
	B	0.00000	0.00000	0.00000
	B	0.00456	0.00432	0.00434

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00909	0.00885	0.00918
	B	0.00000	0.00000	0.00000
	B	0.00946	0.00956	0.01007
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00832	0.00804	0.00833
	B	0.00000	0.00000	0.00000
	B	0.00869	0.00870	0.00911

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00593	0.00570	0.00588
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00809	0.00807	0.00833
	B	A	0.00000	0.00000	0.00000
	B	A	0.00537	0.00518	0.00519
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00902	0.00900	0.00905
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00512	0.00490	0.00503
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00754	0.00749	0.00773
	B	A	0.00000	0.00000	0.00000
	B	A	0.00456	0.00432	0.00433
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00848	0.00842	0.00846

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00909	0.00885	0.00922
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00116	0.00116	0.00127
	B	A	0.00000	0.00000	0.00000
	B	A	0.00946	0.00951	0.01003
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00210	0.00201	0.00208
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00831	0.00804	0.00839
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00043	0.00040	0.00045
	B	A	0.00000	0.00000	0.00000
	B	A	0.00869	0.00869	0.00916
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00136	0.00125	0.00127

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00910	0.00886	0.00931
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00118	0.00123	0.00151
	B	A	0.00000	0.00000	0.00000
	B	A	0.00947	0.00957	0.01019
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00212	0.00207	0.00229
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00832	0.00805	0.00841
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00044	0.00042	0.00052
	B	A	0.00000	0.00000	0.00000
	B	A	0.00869	0.00870	0.00923
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00138	0.00128	0.00133

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00594	0.00575	0.00590
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00810	0.00815	0.00848
	B	A	0.00000	0.00000	0.00000
	B	A	0.00537	0.00518	0.00517
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00905	0.00908	0.00929
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00513	0.00491	0.00505
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00755	0.00754	0.00776
	B	A	0.00000	0.00000	0.00000
	B	A	0.00456	0.00432	0.00444
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00849	0.00845	0.00854

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00409	0.00419	0.14803
sky130_osu_sc_15T_ms__and2_2	0.00409	0.00419	0.28857
sky130_osu_sc_15T_ms__and2_4	0.00409	0.00419	0.54939
sky130_osu_sc_15T_ms__and2_6	0.00249	0.00250	1.80000
sky130_osu_sc_15T_ms__and2_8	0.00408	0.00419	1.03127
sky130_osu_sc_15T_ms__and2_l	0.00309	0.00320	0.09012

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.21362	0.34172
sky130_osu_sc_15T_ms__and2_2	0.00000	0.34174	0.34197
sky130_osu_sc_15T_ms__and2_4	0.00000	0.59796	0.68319
sky130_osu_sc_15T_ms__and2_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__and2_8	0.00000	1.11041	1.36612
sky130_osu_sc_15T_ms__and2_l	0.00000	0.03304	0.05277

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.07017	0.18850	0.65604
	B->Y (RR)	0.07491	0.18935	0.65737
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.08102	0.19372	0.70269
	B->Y (RR)	0.08576	0.19331	0.69860
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.11177	0.22462	0.78958
	B->Y (RR)	0.11657	0.22475	0.77767
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.17180	0.28958	0.92037
	B->Y (RR)	0.17657	0.29063	0.89768
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.07928	0.20952	0.65145
	B->Y (RR)	0.08427	0.20989	0.65177

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (FF)	0.06063	0.17743	0.62181
	B->Y (FF)	0.06402	0.18227	0.63664
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.06906	0.18118	0.66356
	B->Y (FF)	0.07281	0.18538	0.67653
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.09524	0.20664	0.73852
	B->Y (FF)	0.09864	0.21023	0.74767
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.15030	0.26468	0.84714
	B->Y (FF)	0.15287	0.26715	0.85194
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.06888	0.18961	0.58908
	B->Y (FF)	0.07384	0.19609	0.60746

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00429	0.00391	0.00484
	B	0.00000	0.00000	0.00000
	B	0.00437	0.00386	0.00429
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00860	0.00852	0.00928
	B	0.00000	0.00000	0.00000
	B	0.00866	0.00848	0.00889
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01826	0.01837	0.01947
	B	0.00000	0.00000	0.00000
	B	0.01834	0.01835	0.01912
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03951	0.03814	0.03987
	B	0.00000	0.00000	0.00000
	B	0.03982	0.03816	0.03958
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00311	0.00283	0.00347
	B	0.00000	0.00000	0.00000
	B	0.00320	0.00277	0.00308

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.01111	0.01123	0.01288
	B	0.00000	0.00000	0.00000
	B	0.01251	0.01245	0.01396
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01407	0.01465	0.01637
	B	0.00000	0.00000	0.00000
	B	0.01550	0.01576	0.01728
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02170	0.02288	0.02491
	B	0.00000	0.00000	0.00000
	B	0.02309	0.02385	0.02554
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03845	0.03845	0.04223
	B	0.00000	0.00000	0.00000
	B	0.04004	0.03930	0.04218
sky130_osu_sc_15T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00845	0.00841	0.00941
	B	0.00000	0.00000	0.00000
	B	0.00943	0.00926	0.01014

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00413	-0.00414	-0.00413
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00413	-0.00414	-0.00413
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00413	-0.00414	-0.00413
sky130_osu_sc_15T_ms__and2_6	B	0.00000	0.00000	0.00000
	B	-0.00045	-0.00046	-0.00045
	!B	0.00000	0.00000	0.00000
	!B	-0.00038	-0.00039	-0.00038
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00414	-0.00414	-0.00413
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00292	-0.00292	-0.00291

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00413	0.00414	0.00413
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00413	0.00414	0.00413
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00413	0.00414	0.00413
sky130_osu_sc_15T_ms__and2_6	B	0.00000	0.00000	0.00000
	B	0.00045	0.00046	0.00045
	!B	0.00000	0.00000	0.00000
	!B	0.00038	0.00039	0.00038
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00414	0.00414	0.00413
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00292	0.00294	0.00293

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00391	-0.00390
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00390	-0.00390
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00391	-0.00390
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	-0.00045	-0.00045	-0.00045
	!A	0.00000	0.00000	0.00000
	!A	-0.00038	-0.00038	-0.00038
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00391	-0.00390
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00276	-0.00276	-0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00390	0.00391	0.00390
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00390	0.00391	0.00390
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00390	0.00391	0.00390
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.00045	0.00045	0.00045
	!A	0.00000	0.00000	0.00000
	!A	0.00038	0.00038	0.00038
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00391	0.00391	0.00390
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00276	0.00276	0.00276

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00385	0.00402	0.00390	0.06390

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.08224	0.17073

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.07358	0.21976	0.77311
	A1->Y (FR)	0.06125	0.20036	0.73475
	B0->Y (FR)	0.05370	0.19797	0.77272

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (RF)	0.04874	0.14736	0.52926
	A1->Y (RF)	0.04432	0.14675	0.55693
	B0->Y (RF)	0.02862	0.12611	0.52207

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00981	0.00971	0.00971
	A1	0.00000	0.00000	0.00000
	A1	0.00826	0.00813	0.00813
	B0	0.00768	0.00754	0.00788

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00185	0.00152	0.00146
	A1	0.00000	0.00000	0.00000
	A1	0.00189	0.00158	0.00155
	B0	-0.00093	-0.00089	-0.00086

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00329	-0.00354	-0.00355
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00361	-0.00361	-0.00361
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00362	-0.00362	-0.00361

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00356	0.00355	0.00355
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00361	0.00362	0.00361
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00362	0.00362	0.00361

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00325	-0.00348	-0.00350
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00356	-0.00356	-0.00356
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00388	-0.00389	-0.00388

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00350	0.00351	0.00350
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00356	0.00357	0.00356
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00388	0.00390	0.00388

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00170	-0.00171	-0.00170

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00174	0.00174	0.00172

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__aoi22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_ms__aoi22_1	0.00385	0.00400	0.00415	0.00395	0.06555

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_1	0.00000	0.09142	0.34147

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.09001	0.23719	0.79270
	A1->Y (FR)	0.07998	0.22489	0.77516
	B0->Y (FR)	0.05447	0.19615	0.76612
	B1->Y (FR)	0.06470	0.20884	0.78713

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (RF)	0.06440	0.16466	0.55427
	A1->Y (RF)	0.05989	0.16276	0.58151
	B0->Y (RF)	0.03255	0.13391	0.54909
	B1->Y (RF)	0.03705	0.13465	0.52129

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.01204	0.01192	0.01190
	A1	0.01054	0.01036	0.01033
	B0	0.00823	0.00805	0.00838
	B1	0.00970	0.00951	0.00986

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00397	0.00367	0.00353
	A1	0.00401	0.00372	0.00362
	B0	-0.00067	-0.00064	-0.00060
	B1	-0.00060	-0.00069	-0.00066

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00335	-0.00352	-0.00355
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00361	-0.00362	-0.00361
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00361	-0.00362	-0.00361
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00361	-0.00362	-0.00361

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00356	0.00355	0.00355
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00362	0.00362	0.00362
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00362	0.00362	0.00361
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00362	0.00362	0.00361

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00330	-0.00348	-0.00349
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00356	-0.00356	-0.00355
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00388	-0.00388	-0.00388
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00388	-0.00388	-0.00388

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00349	0.00351	0.00349
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00356	0.00357	0.00355
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00388	0.00389	0.00388
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00388	0.00389	0.00388

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00171	-0.00172	-0.00171
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00171	-0.00171	-0.00171
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00401	-0.00402	-0.00401
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00401	-0.00402	-0.00401

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00176	0.00176	0.00173
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00171	0.00171	0.00171
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00401	0.00403	0.00401
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00401	0.00403	0.00401

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00173	-0.00173	-0.00172
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00172	-0.00173	-0.00172
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00368	-0.00370	-0.00368
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00368	-0.00370	-0.00368

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00178	0.00177	0.00174
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00172	0.00173	0.00172
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00369	0.00370	0.00368
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00369	0.00370	0.00368

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__buf_1	7.93650
sky130_osu_sc_15T_ms__buf_2	10.37850
sky130_osu_sc_15T_ms__buf_4	15.26250
sky130_osu_sc_15T_ms__buf_6	20.14650
sky130_osu_sc_15T_ms__buf_8	25.03050
sky130_osu_sc_15T_ms__buf_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00418	0.14574
sky130_osu_sc_15T_ms__buf_2	0.00422	0.28712
sky130_osu_sc_15T_ms__buf_4	0.00421	0.55039
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00422	1.05451
sky130_osu_sc_15T_ms__buf_l	0.00322	0.09036

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.17099	0.17099
sky130_osu_sc_15T_ms__buf_2	0.00000	0.25648	0.34172
sky130_osu_sc_15T_ms__buf_4	0.00000	0.42746	0.68319
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.76944	1.36612
sky130_osu_sc_15T_ms__buf_l	0.00000	0.02657	0.02657

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	A->Y (RR)	0.05364	0.16875	0.62324
sky130_osu_sc_15T_ms__buf_2	A->Y (RR)	0.06154	0.16966	0.66385
sky130_osu_sc_15T_ms__buf_4	A->Y (RR)	0.08343	0.19088	0.73660
sky130_osu_sc_15T_ms__buf_8	A->Y (RR)	0.12562	0.23697	0.84900
sky130_osu_sc_15T_ms__buf_l	A->Y (RR)	0.06137	0.18802	0.61517

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	A->Y (FF)	0.05737	0.17217	0.60751
sky130_osu_sc_15T_ms__buf_2	A->Y (FF)	0.06733	0.18094	0.67653
sky130_osu_sc_15T_ms__buf_4	A->Y (FF)	0.09380	0.20705	0.76090
sky130_osu_sc_15T_ms__buf_8	A->Y (FF)	0.14889	0.26585	0.88114
sky130_osu_sc_15T_ms__buf_l	A->Y (FF)	0.06612	0.18596	0.58250

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00405	0.00362	0.00457
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00826	0.00801	0.00876
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01776	0.01799	0.01876
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03771	0.03759	0.03914
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00303	0.00266	0.00334

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.01068	0.01069	0.01232
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01373	0.01403	0.01566
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02132	0.02219	0.02394
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03803	0.03773	0.04079
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00819	0.00806	0.00909

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00071	-0.00072	-0.00071

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00071	0.00072	0.00071

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00397	0.00395	0.01164	0.13445	0.13037
sky130_osu_sc_15T_ms__dffr_l	0.00397	0.00395	0.01164	0.09038	0.08795

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.48720	0.83589
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.34278	0.69147

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	0.28886	0.52893	1.50146
	QN->Q (FR)	0.03011	0.18267	0.92456
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.28154	0.53450	1.43576
	QN->Q (FR)	0.03358	0.19392	0.89761

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RF)	0.27616	0.50966	1.53638
	QN->Q (RF)	0.02503	0.14936	0.75114
	RN->Q (FF)	0.20217	0.44917	1.53802
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.28145	0.53354	1.49226
	QN->Q (RF)	0.02560	0.14702	0.68034
	RN->Q (FF)	0.20784	0.47363	1.49346

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->QN (RR)	0.24326	0.36481	0.81767
	RN->QN (FR)	0.16920	0.30396	0.81923
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.24537	0.37776	0.82176
	RN->QN (FR)	0.17156	0.31753	0.82312

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	**CK->QN (RF)**	0.24830	0.37053	0.74552
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.23489	0.35577	0.68960

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.06896	-0.06771	-0.09487
	setup	CK (R)	0.22932	0.22303	0.30840
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06917	-0.06915	-0.09773
	setup	CK (R)	0.23267	0.22386	0.31013

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.10718	-0.15911	-0.45491
	setup	CK (R)	0.13080	0.17115	0.46759
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10479	-0.15811	-0.45586
	setup	CK (R)	0.13080	0.17115	0.46759

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.06896	-0.06771	-0.09487
	setup	CK (R)	0.22932	0.22303	0.30840
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06917	-0.06915	-0.09773
	setup	CK (R)	0.23267	0.22386	0.31013

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	hold	CK (R)	-0.10718	-0.15911	-0.45491
	setup	CK (R)	0.13080	0.17115	0.46759
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10479	-0.15811	-0.45586
	setup	CK (R)	0.13080	0.17115	0.46759

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.19509	0.19073	0.27982
	removal	CK (R)	-0.04357	-0.05275	-0.05807
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.19620	0.19108	0.27794
	removal	CK (R)	-0.04357	-0.05275	-0.05807

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	recovery	CK (R)	0.19509	0.19073	0.27982
	removal	CK (R)	-0.04357	-0.05275	-0.05807
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.19620	0.19108	0.27794
	removal	CK (R)	-0.04357	-0.05275	-0.05807

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	RN ()	0.11563	0.15127	0.97290
	min_pulse_width	RN ()	0.11563	0.15127	0.97290
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.11563	0.15127	0.97290
	min_pulse_width	RN ()	0.11353	0.15127	0.97290

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.13587	0.15787	0.97290
	min_pulse_width	CK ()	0.14375	0.14137	0.97290
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.12548	0.14797	0.97290
	min_pulse_width	CK ()	0.14045	0.13807	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.28560	0.28986	0.97290
	min_pulse_width	CK ()	0.10642	0.14137	0.97290
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.28560	0.28986	0.97290
	min_pulse_width	CK ()	0.10642	0.14137	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01068	0.00983	0.00814
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00935	0.00859	0.00809

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01224	0.01144	0.00909
	RN	-0.00141	-0.01911	-0.10890
	RN	0.02838	0.02783	0.02559
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01093	0.01033	0.00947
	RN	-0.00141	-0.01506	-0.07321
	RN	0.02705	0.02670	0.02596

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01223	0.01145	0.00917
	RN	-0.00141	-0.01876	-0.10560
	RN	0.02837	0.02783	0.02565
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01093	0.01033	0.00950
	RN	-0.00141	-0.01482	-0.07124
	RN	0.02704	0.02670	0.02596

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.01064	0.00980	0.00811
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00931	0.00855	0.00803

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00349	-0.00353
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01305	0.01253	0.01248
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00553	0.00505	0.00512
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00349	-0.00353
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01305	0.01253	0.01248
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00553	0.00505	0.00512

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00353	0.00355	0.00353
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02160	0.02131	0.02139
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01033	0.01008	0.01030
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00353	0.00355	0.00353
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02160	0.02131	0.02139
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01034	0.01009	0.01030

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00387	0.00336	0.00411
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01181	0.01113	0.01168
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00387	0.00336	0.00411
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01181	0.01113	0.01168

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01027	0.01003	0.01159
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02142	0.02101	0.02229
sky130_osu_sc_15T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.01026	0.01003	0.01158
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02142	0.02101	0.02228

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00106	-0.00160	-0.00100
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00630	0.00532	0.00553
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00137	-0.00197	-0.00124
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00106	-0.00160	-0.00100
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00630	0.00532	0.00553
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00137	-0.00197	-0.00124

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01571	0.01547	0.01700
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03366	0.03296	0.03355
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02554	0.02509	0.02615
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03290	0.03220	0.03505
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01779	0.01751	0.01891
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01570	0.01547	0.01700
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03366	0.03296	0.03355
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02554	0.02509	0.02615
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03290	0.03221	0.03505
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01779	0.01751	0.01891

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffsr_1	0.00393	0.00396	0.00867	0.01190	0.15044	0.14706
sky130_osu_sc_15T_ms__dffsr_l	0.00393	0.00396	0.00866	0.01190	0.09038	0.08742

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.60153	0.83567
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.45711	0.69125

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.28169	0.52490	1.58075
	QN->Q (FR)	0.02624	0.16828	0.87890
	RN->Q (RR)	0.22817	0.47617	1.54261
	SN->Q (FR)	0.20291	0.45500	1.60227
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.28309	0.53416	1.44173
	QN->Q (FR)	0.03359	0.19361	0.89594
	RN->Q (RR)	0.23013	0.48613	1.40425
	SN->Q (FR)	0.20713	0.46673	1.45965

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RF)	0.31858	0.55998	1.65496
	QN->Q (RF)	0.02473	0.15471	0.80454
	RN->Q (FF)	0.20969	0.46130	1.62588
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.32926	0.58492	1.54448
	QN->Q (RF)	0.02555	0.14679	0.67957
	RN->Q (FF)	0.22022	0.48681	1.51606

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RR)	0.28559	0.41058	0.87906
	RN->QN (FR)	0.17728	0.31198	0.85053
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.29244	0.42823	0.87186
	RN->QN (FR)	0.18382	0.33021	0.84327

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->QN (RF)	0.24505	0.37012	0.79246
	RN->QN (RF)	0.19198	0.32128	0.75445
	SN->QN (FF)	0.16895	0.30186	0.81478
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.23821	0.35686	0.69466
	RN->QN (RF)	0.18562	0.30860	0.65759
	SN->QN (FF)	0.16265	0.28918	0.71294

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.06886	-0.06866	-0.10399
	setup	CK (R)	0.21526	0.20907	0.29971
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06621	-0.06716	-0.10562
	setup	CK (R)	0.21796	0.20898	0.29960

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.12368	-0.17216	-0.48431
	setup	CK (R)	0.15607	0.18746	0.50150
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12299	-0.17267	-0.48483
	setup	CK (R)	0.15521	0.18746	0.49845

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.06886	-0.06866	-0.10399
	setup	CK (R)	0.21526	0.20907	0.29971
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06621	-0.06716	-0.10562
	setup	CK (R)	0.21796	0.20898	0.29960

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	hold	CK (R)	-0.12368	-0.17216	-0.48431
	setup	CK (R)	0.15607	0.18746	0.50150
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12299	-0.17267	-0.48483
	setup	CK (R)	0.15521	0.18746	0.49845

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.16518	0.16142	0.24762
	removal	CK (R)	-0.02118	-0.02530	-0.03219
	hold	SN (R)	-0.16212	-0.19983	-0.43773
	setup	SN (R)	0.18772	0.22000	0.56606
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.16444	0.16109	0.24834
	removal	CK (R)	-0.02072	-0.02379	-0.03441
	hold	SN (R)	-0.15758	-0.19253	-0.42121
	setup	SN (R)	0.18598	0.22000	0.55478

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.16518	0.16142	0.24762
	removal	CK (R)	-0.02118	-0.02530	-0.03219
	hold	SN (R)	-0.16212	-0.19983	-0.43878
	hold	SN (R)	-0.16592	-0.20002	-0.43773
	setup	SN (R)	0.18598	0.22000	0.56381
	setup	SN (R)	0.18772	0.22000	0.56606
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.16444	0.16109	0.24834
	removal	CK (R)	-0.02072	-0.02379	-0.03441
	hold	SN (R)	-0.15798	-0.19253	-0.42121
	hold	SN (R)	-0.15758	-0.19279	-0.42585
	setup	SN (R)	0.18598	0.22000	0.54934
	setup	SN (R)	0.17898	0.21246	0.55478

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	RN ()	0.13453	0.16447	0.97290
	min_pulse_width	RN ()	0.13684	0.16447	0.97290
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.13453	0.16447	0.97290
	min_pulse_width	RN ()	0.13190	0.16117	0.97290

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.04413	0.04772	0.11753
	removal	CK (R)	-0.01728	-0.03130	-0.09126
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04295	0.04900	0.11858
	removal	CK (R)	-0.01786	-0.03130	-0.09126

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	recovery	CK (R)	0.04413	0.04772	0.11753
	removal	CK (R)	-0.01728	-0.03130	-0.09126
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04295	0.04900	0.11858
	removal	CK (R)	-0.01786	-0.03130	-0.09126

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	SN ()	0.16083	0.19747	0.97290
	min_pulse_width	SN ()	0.16346	0.20077	0.97290
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.16083	0.19747	0.97290
	min_pulse_width	SN ()	0.15557	0.19087	0.97290

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.12873	0.14467	0.97290
	min_pulse_width	CK ()	0.16260	0.15787	0.97290
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.12195	0.14137	0.97290
	min_pulse_width	CK ()	0.15930	0.15457	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.27260	0.27666	0.97290
	min_pulse_width	CK ()	0.13641	0.16117	0.97290
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.27260	0.27666	0.97290
	min_pulse_width	CK ()	0.13416	0.16117	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01342	0.01258	0.01041
	RN	0.02475	0.02418	0.02158
	SN	-0.00141	-0.02045	-0.12186
	SN	0.02758	0.02701	0.02392
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01224	0.01154	0.01096
	RN	0.02356	0.02312	0.02214
	SN	-0.00141	-0.01506	-0.07321
	SN	0.02639	0.02595	0.02447

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01418	0.01369	0.01228
	RN	-0.00141	-0.02045	-0.12186
	RN	0.02951	0.02915	0.02775
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01294	0.01242	0.01158
	RN	-0.00141	-0.01506	-0.07321
	RN	0.02824	0.02785	0.02706

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01417	0.01368	0.01228
	RN	-0.00141	-0.02017	-0.11911
	RN	0.02950	0.02914	0.02777
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01294	0.01242	0.01162
	RN	-0.00141	-0.01476	-0.07081
	RN	0.02824	0.02785	0.02708

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01338	0.01255	0.01041
	RN	0.02471	0.02416	0.02160
	SN	-0.00141	-0.02017	-0.11910
	SN	0.02754	0.02699	0.02396
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01219	0.01149	0.01089
	RN	0.02351	0.02308	0.02208
	SN	-0.00141	-0.01476	-0.07079
	SN	0.02635	0.02591	0.02445

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00340	-0.00350	-0.00352
	(!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)	0.01700	0.01651	0.01642
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00633	0.00588	0.00593
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00634	0.00589	0.00595
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00639	0.00594	0.00599
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00340	-0.00350	-0.00352
	(!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)	0.01700	0.01651	0.01642
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00633	0.00588	0.00593
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00634	0.00589	0.00595
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00639	0.00594	0.00599

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00352	0.00354	0.00352
	(!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)	0.02476	0.02448	0.02437
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01111	0.01089	0.01108
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01113	0.01091	0.01109
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01105	0.01083	0.01103
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00352	0.00354	0.00352
	(!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)	0.02475	0.02447	0.02436
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01109	0.01088	0.01107
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01111	0.01090	0.01108
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01104	0.01082	0.01101

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00319	0.00268	0.00335
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01426	0.01357	0.01402
sky130_osu_sc_15T_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)	0.00319	0.00268	0.00335
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01427	0.01357	0.01402

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.01118	0.01093	0.01254
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02280	0.02233	0.02352
sky130_osu_sc_15T_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)	0.01117	0.01092	0.01253
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02278	0.02232	0.02350

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	-0.00820	-0.00822	-0.00819
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00835	-0.00866	-0.00863
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00809	-0.00820	-0.00821
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00503	0.00451	0.00461
sky130_osu_sc_15T_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)	-0.00820	-0.00822	-0.00819
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00833	-0.00864	-0.00861
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00809	-0.00820	-0.00820
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00504	0.00452	0.00462

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_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)	0.00820	0.00823	0.00819
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00863	0.00866	0.00863
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00821	0.00824	0.00821
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01775	0.01743	0.01741
sky130_osu_sc_15T_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)	0.00820	0.00823	0.00819
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00861	0.00864	0.00861
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00821	0.00824	0.00820
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01774	0.01742	0.01740

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00105	-0.00160	-0.00100
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00728	0.00636	0.00661
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00722	0.00630	0.00653
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00116	-0.00176	-0.00104
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00432	0.00313	0.00441
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00106	-0.00160	-0.00101
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00727	0.00635	0.00659
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00720	0.00630	0.00652
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00116	-0.00176	-0.00104
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00432	0.00313	0.00441

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

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_15T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03772	0.03705	0.03771
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01577	0.01553	0.01706
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02611	0.02569	0.02678
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02615	0.02572	0.02682
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03601	0.03527	0.03771
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01763	0.01735	0.01875
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02117	0.02058	0.02349
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03772	0.03705	0.03771
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01577	0.01553	0.01706
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02611	0.02569	0.02678
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02615	0.02572	0.02682
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03600	0.03526	0.03770
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01763	0.01735	0.01875
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02116	0.02057	0.02348

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00395	0.00691	0.01168	0.13491	0.13141
sky130_osu_sc_15T_ms__dffs_l	0.00395	0.00691	0.01168	0.09092	0.08733

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.43025	0.66440
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.28583	0.51998

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.22468	0.45410	1.42625
	QN->Q (FR)	0.03008	0.18218	0.92156
	SN->Q (FR)	0.17512	0.42305	1.52187
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.22318	0.46755	1.37248
	QN->Q (FR)	0.03353	0.19370	0.89744
	SN->Q (FR)	0.17391	0.43745	1.46103

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RF)	0.30617	0.54477	1.57304
	QN->Q (RF)	0.02489	0.14873	0.74958
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.31021	0.56641	1.53001
	QN->Q (RF)	0.02549	0.14672	0.68049

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RR)	0.27205	0.39931	0.85525
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.27316	0.40918	0.85027

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->QN (RF)	0.18767	0.30020	0.67301
	SN->QN (FF)	0.13768	0.26889	0.76915
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.18023	0.29170	0.61992
	SN->QN (FF)	0.13049	0.26111	0.70887

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.05091	-0.05555	-0.08536
	setup	CK (R)	0.16819	0.16324	0.25708
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05210	-0.05634	-0.08596
	setup	CK (R)	0.16819	0.16337	0.25891

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.10750	-0.16019	-0.45703
	setup	CK (R)	0.14394	0.17389	0.47336
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10809	-0.16021	-0.45833
	setup	CK (R)	0.14392	0.17389	0.47336

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.05091	-0.05555	-0.08536
	setup	CK (R)	0.16819	0.16324	0.25708
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05210	-0.05634	-0.08596
	setup	CK (R)	0.16819	0.16337	0.25891

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	hold	CK (R)	-0.10750	-0.16019	-0.45703
	setup	CK (R)	0.14394	0.17389	0.47336
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10809	-0.16021	-0.45833
	setup	CK (R)	0.14392	0.17389	0.47336

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04273	0.04683	0.09458
	removal	CK (R)	-0.01941	-0.02777	-0.06870
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04000	0.04653	0.09710
	removal	CK (R)	-0.01941	-0.02777	-0.06870

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	recovery	CK (R)	0.04273	0.04683	0.09458
	removal	CK (R)	-0.01941	-0.02777	-0.06870
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04000	0.04653	0.09710
	removal	CK (R)	-0.01941	-0.02777	-0.06870

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	SN ()	0.12208	0.18097	0.97290
	min_pulse_width	SN ()	0.12680	0.18427	0.97290
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.12030	0.17437	0.97290
	min_pulse_width	SN ()	0.11785	0.17437	0.97290

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.09930	0.13147	0.97290
	min_pulse_width	CK ()	0.15271	0.14797	0.97290
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.09346	0.12817	0.97290
	min_pulse_width	CK ()	0.14704	0.14467	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.22380	0.23047	0.97290
	min_pulse_width	CK ()	0.12343	0.14797	0.97290
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.22380	0.23047	0.97290
	min_pulse_width	CK ()	0.12139	0.14797	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01066	0.00982	0.00819
	SN	-0.00141	-0.01915	-0.10928
	SN	0.02319	0.02262	0.02045
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00933	0.00856	0.00810
	SN	-0.00141	-0.01511	-0.07365
	SN	0.02186	0.02136	0.02042

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01216	0.01143	0.00912
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01085	0.01030	0.00945

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01215	0.01143	0.00918
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01085	0.01030	0.00949

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.01061	0.00979	0.00818
	SN	-0.00141	-0.01885	-0.10641
	SN	0.02315	0.02259	0.02046
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00929	0.00853	0.00807
	SN	-0.00141	-0.01475	-0.07072
	SN	0.02182	0.02133	0.02036

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00346	-0.00356	-0.00358
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01258	0.01206	0.01200
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00540	0.00492	0.00499
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00346	-0.00356	-0.00358
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01258	0.01206	0.01200
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00540	0.00492	0.00499

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00358	0.00360	0.00358
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02126	0.02095	0.02100
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01058	0.01034	0.01055
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00358	0.00360	0.00358
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02126	0.02095	0.02100
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01058	0.01034	0.01055

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00590	-0.00591	-0.00588
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00442	0.00401	0.00430
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00590	-0.00591	-0.00588
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00442	0.00401	0.00430

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00590	0.00591	0.00588
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01219	0.01182	0.01238
sky130_osu_sc_15T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00590	0.00591	0.00588
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01219	0.01182	0.01238

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00109	-0.00163	-0.00103
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00132	-0.00192	-0.00119
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00333	0.00212	0.00352
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00109	-0.00163	-0.00103
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00132	-0.00192	-0.00119
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00333	0.00212	0.00352

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03327	0.03258	0.03333
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01572	0.01549	0.01702
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03243	0.03165	0.03438
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01772	0.01744	0.01885
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02054	0.02000	0.02298
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03327	0.03258	0.03333
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01572	0.01549	0.01703
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03243	0.03165	0.03438
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01772	0.01744	0.01885
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02054	0.02000	0.02298

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00411	0.01154	0.15093	0.14735
sky130_osu_sc_15T_ms__dff_l	0.00411	0.01153	0.08164	0.07848

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.54683	0.68402
sky130_osu_sc_15T_ms__dff_l	0.00000	0.40241	0.53960

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.18537	0.41460	1.46952
	QN->Q (FR)	0.02607	0.16808	0.87743
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.19315	0.42702	1.27147
	QN->Q (FR)	0.03786	0.20831	0.93244

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RF)	0.26226	0.49875	1.59298
	QN->Q (RF)	0.02462	0.15460	0.80397
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.27728	0.52573	1.43077
	QN->Q (RF)	0.02561	0.14192	0.64244

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.23048	0.34992	0.81564
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.24074	0.37377	0.80263

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RF)	0.15248	0.26341	0.68041
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.15011	0.25201	0.55495

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.04544	-0.04848	-0.07745
	setup	CK (R)	0.12733	0.12355	0.22649
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.04492	-0.04848	-0.07835
	setup	CK (R)	0.12459	0.12233	0.22465

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	hold	CK (R)	-0.10119	-0.15957	-0.46387
	setup	CK (R)	0.12233	0.16987	0.47722
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.10220	-0.16003	-0.46412
	setup	CK (R)	0.12063	0.17074	0.47536

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.08305	0.12817	0.97290
	min_pulse_width	CK ()	0.14045	0.13807	0.97290
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.07957	0.12817	0.97290
	min_pulse_width	CK ()	0.13807	0.13807	0.97290

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	min_pulse_width	CK ()	0.18224	0.18757	0.97290
	min_pulse_width	CK ()	0.09865	0.14137	0.97290
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.18224	0.18757	0.97290
	min_pulse_width	CK ()	0.09865	0.14137	0.97290

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01127	0.01031	0.00831
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01011	0.00932	0.00897

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01238	0.01189	0.01050
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01113	0.01047	0.00920

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01237	0.01189	0.01053
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01113	0.01047	0.00926

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.01123	0.01029	0.00834
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01007	0.00927	0.00895

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00348	-0.00352
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01173	0.01124	0.01133
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00314	-0.00348	-0.00352
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01174	0.01124	0.01135

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00352	0.00354	0.00352
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02196	0.02160	0.02172
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00352	0.00354	0.00352
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02197	0.02161	0.02172

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00108	-0.00163	-0.00102
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00189	-0.00116
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00108	-0.00163	-0.00102
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00189	-0.00116

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01566	0.01540	0.01694
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03244	0.03177	0.03259
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03293	0.03217	0.03493
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01762	0.01734	0.01875
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01566	0.01540	0.01694
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03245	0.03177	0.03260
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03293	0.03217	0.03494
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01762	0.01734	0.01875

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__inv_1	5.49450
sky130_osu_sc_15T_ms__inv_10	27.47250
sky130_osu_sc_15T_ms__inv_2	7.93650
sky130_osu_sc_15T_ms__inv_3	10.37850
sky130_osu_sc_15T_ms__inv_4	12.82050
sky130_osu_sc_15T_ms__inv_6	17.70450
sky130_osu_sc_15T_ms__inv_8	22.58850
sky130_osu_sc_15T_ms__inv_l	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00400	0.14001
sky130_osu_sc_15T_ms__inv_10	0.03678	1.27308
sky130_osu_sc_15T_ms__inv_2	0.00758	0.28020
sky130_osu_sc_15T_ms__inv_3	0.01128	0.39908
sky130_osu_sc_15T_ms__inv_4	0.01490	0.53674
sky130_osu_sc_15T_ms__inv_6	0.02231	0.79344
sky130_osu_sc_15T_ms__inv_8	0.02957	1.04569
sky130_osu_sc_15T_ms__inv_l	0.00299	0.07955

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.08549	0.17073
sky130_osu_sc_15T_ms__inv_10	0.00000	0.85493	1.70733
sky130_osu_sc_15T_ms__inv_2	0.00000	0.17098	0.34147
sky130_osu_sc_15T_ms__inv_3	0.00000	0.25648	0.51220
sky130_osu_sc_15T_ms__inv_4	0.00000	0.34197	0.68293
sky130_osu_sc_15T_ms__inv_6	0.00000	0.51296	1.02440
sky130_osu_sc_15T_ms__inv_8	0.00000	0.68394	1.36587
sky130_osu_sc_15T_ms__inv_l	0.00000	0.01328	0.02620

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.02489	0.15447	0.78767
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03594	0.12247	0.80157
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02026	0.13387	0.78719
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02243	0.12826	0.78712
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02293	0.12324	0.78651
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02616	0.11945	0.79149
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03073	0.11969	0.79703
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.03271	0.17802	0.79295

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (RF)**	0.02197	0.13300	0.68154
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03273	0.10547	0.69176
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01809	0.11627	0.68411
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01993	0.11165	0.68892
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01991	0.10612	0.68801
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02433	0.10378	0.69304
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02848	0.10382	0.69639
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02347	0.12877	0.57928

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00560	0.00566	0.00601
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04771	0.04960	0.05408
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00987	0.01029	0.01094
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01516	0.01569	0.01683
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01943	0.02011	0.02179
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02885	0.02973	0.03262
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03821	0.03936	0.04331
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00417	0.00414	0.00437

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00125	-0.00120	-0.00110
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01927	-0.01917	-0.01531
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00383	-0.00357	-0.00322
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00512	-0.00491	-0.00414
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00779	-0.00733	-0.00629
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.01185	-0.01134	-0.00932
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01585	-0.01534	-0.01234
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00076	-0.00078	-0.00071

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_15T_ms__mux2_1	0.03936	0.03925	0.00818	0.03501

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.17148	0.17243

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.01360	0.06539	0.23251
	A1->Y (RR)	-	0.01494	0.06705	0.23408
	S0->Y (RR)	(!A0 * A1)	0.04588	0.10929	0.24609
	S0->Y (FR)	(A0 * !A1)	0.03230	0.11161	0.33557

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (FF)	-	0.01366	0.06613	0.23231
	A1->Y (FF)	-	0.01286	0.06473	0.23056
	S0->Y (FF)	(!A0 * A1)	0.05567	0.12715	0.31043
	S0->Y (RF)	(A0 * !A1)	0.02516	0.09297	0.27488

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00566	-0.00567	-0.00566
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00381	-0.00382	-0.00381
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00691	0.00677	0.00860
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00391	-0.00438	-0.00341

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00566	0.00567	0.00566
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00381	0.00382	0.00381
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00096	0.00054	0.00165
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01513	0.01491	0.01655

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00137	-0.00136	-0.00136

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00137	0.00136	0.00136

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00163	-0.00162	-0.00163

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00163	0.00162	0.00163

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00151	-0.00197	-0.00084
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00146	-0.00195	-0.00089

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.01153	0.01131	0.01297
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01052	0.01036	0.01219

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00400	0.00398	0.11795
sky130_osu_sc_15T_ms__nand2_l	0.00299	0.00298	0.07744

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.08551	0.34147
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.01329	0.05241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.02567	0.14815	0.71970
	B->Y (FR)	0.03039	0.15095	0.71342
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.03355	0.17809	0.78408
	B->Y (FR)	0.04036	0.18408	0.78861

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (RF)	0.03140	0.16154	0.78180
	B->Y (RF)	0.03596	0.16309	0.75934
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.03384	0.16548	0.71926
	B->Y (RF)	0.03787	0.16526	0.69215

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00595	0.00599	0.00631
	B	0.00000	0.00000	0.00000
	B	0.00752	0.00746	0.00775
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00439	0.00438	0.00456
	B	0.00000	0.00000	0.00000
	B	0.00550	0.00542	0.00561

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00088	-0.00095	-0.00086
	B	0.00000	0.00000	0.00000
	B	-0.00083	-0.00095	-0.00089
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00062	-0.00055
	B	0.00000	0.00000	0.00000
	B	-0.00052	-0.00062	-0.00058

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00405	-0.00405	-0.00405
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00279	-0.00279	-0.00279

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00405	0.00405	0.00405
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00279	0.00279	0.00281

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00375	-0.00375	-0.00374
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00259	-0.00259	-0.00258

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00375	0.00375	0.00374
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00259	0.00259	0.00258

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00397	0.00426	0.07300
sky130_osu_sc_15T_ms__nor2_l	0.00289	0.00321	0.04487

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.06206	0.17073
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.01030	0.02620

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.05303	0.19629	0.77176
	B->Y (FR)	0.04060	0.18274	0.77050
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.06401	0.22207	0.77105
	B->Y (FR)	0.05294	0.21044	0.77860

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (RF)	0.03028	0.12105	0.49312
	B->Y (RF)	0.02349	0.11304	0.48173
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02985	0.11729	0.43525
	B->Y (RF)	0.02482	0.11132	0.42512

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00802	0.00791	0.00799
	B	0.00000	0.00000	0.00000
	B	0.00612	0.00607	0.00647
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00566	0.00557	0.00561
	B	0.00000	0.00000	0.00000
	B	0.00449	0.00439	0.00466

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00074	0.00050	0.00052
	B	0.00000	0.00000	0.00000
	B	-0.00097	-0.00102	-0.00090
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00044	0.00030	0.00035
	B	0.00000	0.00000	0.00000
	B	-0.00055	-0.00059	-0.00051

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00316	-0.00352	-0.00354
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00214	-0.00234	-0.00235

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00354	0.00356	0.00354
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00235	0.00234	0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00172	-0.00172	-0.00171
sky130_osu_sc_15T_ms__nor2_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_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00173	0.00174	0.00173
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00114	0.00113	0.00113

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00400	0.00409	0.00339	0.06842

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.04095	0.19694

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.05721	0.19848	0.77155
	A1->Y (FR)	0.07309	0.21604	0.77753
	B0->Y (FR)	0.03955	0.16985	0.70629

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (RF)	0.04400	0.14863	0.56344
	A1->Y (RF)	0.05269	0.15499	0.56171
	B0->Y (RF)	0.03405	0.14488	0.60329

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00834	0.00818	0.00851
	A1	0.00000	0.00000	0.00000
	A1	0.01025	0.01010	0.01012
	B0	0.00685	0.00673	0.00694

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00014	-0.00003	-0.00003
	A1	0.00000	0.00000	0.00000
	A1	0.00184	0.00153	0.00147
	B0	0.00262	0.00252	0.00253

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00173	-0.00174	-0.00173
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00344	-0.00354	-0.00358
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00363	-0.00365	-0.00364

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00175	0.00175	0.00173
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00358	0.00357	0.00358
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00363	0.00365	0.00364

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00308	-0.00344	-0.00346
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00340	-0.00353	-0.00353
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00359	-0.00360	-0.00359

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00347	0.00349	0.00347
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00353	0.00354	0.00353
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00359	0.00360	0.00359

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00291	-0.00291	-0.00291

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00291	0.00292	0.00291

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00387	0.00410	0.00422	0.00412	0.06773

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.09310	0.34147

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.07917	0.21889	0.76619
	A1->Y (FR)	0.06657	0.20281	0.76413
	B0->Y (FR)	0.04576	0.18352	0.74408
	B1->Y (FR)	0.05933	0.19861	0.74626

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (RF)	0.07521	0.18355	0.60020
	A1->Y (RF)	0.06019	0.16707	0.58015
	B0->Y (RF)	0.05085	0.16360	0.61917
	B1->Y (RF)	0.06653	0.18042	0.64183

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.01330	0.01316	0.01317
	A1	0.01135	0.01108	0.01148
	B0	0.00842	0.00833	0.00866
	B1	0.01046	0.01032	0.01034

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00305	0.00277	0.00268
	A1	0.00154	0.00135	0.00125
	B0	0.00153	0.00137	0.00135
	B1	0.00307	0.00280	0.00277

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00315	-0.00352	-0.00354
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00315	-0.00352	-0.00354
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00343	-0.00354	-0.00355
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00360	-0.00361	-0.00360

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00354	0.00355	0.00354
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00354	0.00355	0.00354
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00354	0.00355	0.00356
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00360	0.00362	0.00360

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00170	-0.00171	-0.00170
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00170	-0.00171	-0.00170
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00338	-0.00348	-0.00350
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00358	-0.00358	-0.00358

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00173	0.00173	0.00171
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00173	0.00173	0.00171
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00352	0.00352	0.00350
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00358	0.00359	0.00358

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00169	-0.00169	-0.00169
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00169	-0.00170	-0.00169
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00380	-0.00390	-0.00391
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00399	-0.00399	-0.00399

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00171	0.00172	0.00170
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00171	0.00172	0.00170
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00392	0.00394	0.00391
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00399	0.00400	0.00399

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00310	-0.00345	-0.00347
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00310	-0.00345	-0.00347
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00390	-0.00401	-0.00402
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00407	-0.00407	-0.00407

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00348	0.00350	0.00348
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00348	0.00350	0.00348
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00401	0.00402	0.00403
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00407	0.00407	0.00407

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00432	0.00410	0.14507
sky130_osu_sc_15T_ms__or2_2	0.00432	0.00410	0.28586
sky130_osu_sc_15T_ms__or2_4	0.00430	0.00410	0.54772
sky130_osu_sc_15T_ms__or2_8	0.00431	0.00411	1.04407
sky130_osu_sc_15T_ms__or2_l	0.00328	0.00304	0.08168

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.10493	0.17124
sky130_osu_sc_15T_ms__or2_2	0.00000	0.14780	0.34197
sky130_osu_sc_15T_ms__or2_4	0.00000	0.23355	0.68344
sky130_osu_sc_15T_ms__or2_8	0.00000	0.40504	1.36637
sky130_osu_sc_15T_ms__or2_l	0.00000	0.01713	0.02693

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.06602	0.18690	0.66039
	B->Y (RR)	0.05715	0.17446	0.62921
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.07290	0.18447	0.69529
	B->Y (RR)	0.06373	0.17341	0.66802
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.09509	0.20413	0.76453
	B->Y (RR)	0.08578	0.19464	0.74204
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.13721	0.24870	0.87148
	B->Y (RR)	0.12788	0.23991	0.85444
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.07277	0.20687	0.64347
	B->Y (RR)	0.06466	0.19563	0.61550

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (FF)	0.10363	0.22756	0.70521
	B->Y (FF)	0.08666	0.21137	0.68225
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.12258	0.24366	0.76057
	B->Y (FF)	0.10576	0.22612	0.74739
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.17204	0.29537	0.86456
	B->Y (FF)	0.15528	0.27764	0.86132
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.27374	0.40287	1.02795
	B->Y (FF)	0.25703	0.38450	1.03075
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.12108	0.24107	0.63215
	B->Y (FF)	0.10217	0.22401	0.61918

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00597	0.00539	0.00569
	B	0.00000	0.00000	0.00000
	B	0.00443	0.00421	0.00497
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01029	0.00992	0.01026
	B	0.00000	0.00000	0.00000
	B	0.00866	0.00879	0.00962
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01980	0.01991	0.02033
	B	0.00000	0.00000	0.00000
	B	0.01811	0.01893	0.01992
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03987	0.03955	0.04075
	B	0.00000	0.00000	0.00000
	B	0.03819	0.03851	0.04096
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00429	0.00389	0.00421
	B	0.00000	0.00000	0.00000
	B	0.00332	0.00313	0.00369

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01317	0.01293	0.01321
	B	0.00000	0.00000	0.00000
	B	0.01091	0.01100	0.01246
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01618	0.01633	0.01673
	B	0.00000	0.00000	0.00000
	B	0.01393	0.01438	0.01577
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02431	0.02424	0.02513
	B	0.00000	0.00000	0.00000
	B	0.02206	0.02207	0.02398
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04454	0.04049	0.04204
	B	0.00000	0.00000	0.00000
	B	0.04229	0.03816	0.04059
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00972	0.00931	0.00953
	B	0.00000	0.00000	0.00000
	B	0.00815	0.00810	0.00894

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00320	-0.00354	-0.00356
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00318	-0.00354	-0.00356
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00318	-0.00354	-0.00356
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00318	-0.00355	-0.00356
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00216	-0.00237	-0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00358	0.00356
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00358	0.00356
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00359	0.00356
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00359	0.00357
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00237	0.00238	0.00237

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00173	-0.00174	-0.00173
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00172	-0.00172	-0.00173
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00115	-0.00116	-0.00115

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00175	0.00175	0.00173
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00175	0.00173
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00175	0.00174
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00176	0.00175	0.00174
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00116	0.00116	0.00115

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00425	0.00546	0.07370
sky130_osu_sc_15T_ms__tbufi_l	0.00321	0.00417	0.04509

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.08568	0.34147
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.01353	0.05241

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.03851	0.18055	0.76901
	OE->Y (FR)	0.04282	0.09114	0.37251
	OE->Y (RR)	0.07301	0.20170	0.60991
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.05092	0.20789	0.77949
	OE->Y (FR)	0.04914	0.10203	0.37232
	OE->Y (RR)	0.08282	0.22545	0.60111

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.03074	0.13837	0.59188
	OE->Y (FF)	0.04326	0.09165	0.37249
	OE->Y (RF)	0.03000	0.13557	0.56156
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.03363	0.13818	0.52704
	OE->Y (FF)	0.04983	0.10143	0.37232
	OE->Y (RF)	0.03198	0.13328	0.49156

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00572	0.00568	0.00604
	OE	0.00000	0.00000	0.00000
	OE	0.00560	0.00515	0.00638
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00422	0.00404	0.00435
	OE	0.00000	0.00000	0.00000
	OE	0.00395	0.00360	0.00447

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00098	-0.00096	-0.00093
	OE	0.00000	0.00000	0.00000
	OE	0.00357	0.00312	0.00433
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00057	-0.00054
	OE	0.00000	0.00000	0.00000
	OE	0.00241	0.00206	0.00295

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00284	-0.00285	-0.00284
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00252	-0.00252	-0.00251
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00203	-0.00204	-0.00203
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00181	-0.00180	-0.00180

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00284	0.00285	0.00284
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00253	0.00254	0.00253
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00203	0.00204	0.00203
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00183	0.00182	0.00181

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00212	0.00169	0.00294
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00188	0.00144	0.00269
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00140	0.00106	0.00195
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00124	0.00090	0.00179

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00664	0.00632	0.00802
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00676	0.00653	0.00823
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00506	0.00480	0.00589
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00518	0.00495	0.00602

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	**OE**	**Y**
sky130_osu_sc_15T_ms__tnbufi_1	0.00424	0.00650	0.07385
sky130_osu_sc_15T_ms__tnbufi_l	0.00320	0.00467	0.04502

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.14251	0.17099
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.02214	0.02657

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (FR)	0.03885	0.18074	0.76993
	OE->Y (RR)	0.02833	0.07464	0.37305
	OE->Y (FR)	0.04953	0.19372	0.77003
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.05127	0.20775	0.77868
	OE->Y (RR)	0.02824	0.07455	0.37300
	OE->Y (FR)	0.06088	0.22065	0.77117

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (RF)	0.03026	0.13824	0.59237
	OE->Y (RF)	0.02802	0.07460	0.37306
	OE->Y (FF)	0.05197	0.15674	0.48425
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.03300	0.13781	0.52635
	OE->Y (RF)	0.02806	0.07451	0.37300
	OE->Y (FF)	0.05942	0.16653	0.45422

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00589	0.00584	0.00620
	OE	0.00000	0.00000	0.00000
	OE	0.01432	0.01434	0.01648
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00439	0.00421	0.00451
	OE	0.00000	0.00000	0.00000
	OE	0.01029	0.01024	0.01158

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00120	-0.00117	-0.00114
	OE	0.00000	0.00000	0.00000
	OE	0.01250	0.01264	0.01454
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00077	-0.00078	-0.00075
	OE	0.00000	0.00000	0.00000
	OE	0.00891	0.00893	0.01016

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00241	-0.00242	-0.00241
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00212	-0.00212	-0.00211
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00163	-0.00163	-0.00162
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00143	-0.00142	-0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00241	0.00242	0.00241
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00213	0.00214	0.00213
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00163	0.00163	0.00162
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00144	0.00143	0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00430	-0.00508	-0.00371
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00422	-0.00496	-0.00365
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00276	-0.00330	-0.00236
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00269	-0.00321	-0.00231

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01082	0.01087	0.01296
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01066	0.01076	0.01280
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00772	0.00772	0.00901
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00762	0.00762	0.00889

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__xnor2_1	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_1	0.00842	0.00751	0.07455

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_1	0.00000	0.29373	0.51245

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.09182	0.22433	0.64582
	A->Y (FR)	!B	0.05136	0.19373	0.78349
	B->Y (RR)	A	0.07394	0.20744	0.62746
	B->Y (FR)	!A	0.06886	0.21216	0.78865

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.09015	0.20380	0.56144
	A->Y (RF)	!B	0.04271	0.14671	0.57522
	B->Y (FF)	A	0.07753	0.19163	0.55007
	B->Y (RF)	!A	0.05384	0.15899	0.58932

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00564	0.00509	0.00610
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01414	0.01390	0.01588
	B	A	0.00000	0.00000	0.00000
	B	A	0.00205	0.00173	0.00292
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01540	0.01511	0.01702

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01713	0.01659	0.01805
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00363	0.00300	0.00412
	B	A	0.00000	0.00000	0.00000
	B	A	0.01563	0.01562	0.01740
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00471	0.00397	0.00506

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
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_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00843	0.00755	0.07309

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.29373	0.48995

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.09138	0.22022	0.63712
	A->Y (FR)	B	0.06398	0.20660	0.78239
	B->Y (RR)	!A	0.07792	0.21180	0.63088
	B->Y (FR)	A	0.07041	0.21357	0.78885

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (FF)	!B	0.08033	0.19445	0.54924
	A->Y (RF)	B	0.04454	0.15545	0.60791
	B->Y (FF)	!A	0.07533	0.18983	0.54540
	B->Y (RF)	A	0.05330	0.15924	0.58495

Power Information

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01665	0.01639	0.01833
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00296	0.00183	0.00269
	B	A	0.00000	0.00000	0.00000
	B	A	0.01700	0.01680	0.01871
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00184	0.00148	0.00261

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

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_15T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00295	0.00210	0.00314
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01778	0.01774	0.01944
	B	A	0.00000	0.00000	0.00000
	B	A	0.00299	0.00218	0.00322
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01589	0.01600	0.01780

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_TT_1P8_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Max Cap(pf)
	Y
sky130_osu_sc_15T_ms__tiehi	0.34649
sky130_osu_sc_15T_ms__tielo	0.53018

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000	0.00000	0.00000