sky130_osu_sc_15T_ms_ss_1P60_100C.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_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.01626	0.01621	0.01247	1.48897	0.66875	1.44549
sky130_osu_sc_15T_ms__addf_l	0.01626	0.01621	0.01246	0.78836	0.67084	0.79953

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.83224	1.02764
sky130_osu_sc_15T_ms__addf_l	0.00000	0.50343	0.69883

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)	0.24855	2.38638	30.78890
	B->CO (RR)	0.24864	2.34437	30.14320
	CI->CO (RR)	0.23519	2.41131	31.32190
	CON->CO (FR)	0.03479	0.82518	11.08440
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.26651	2.16403	22.14630
	B->CO (RR)	0.26627	2.13996	22.00860
	CI->CO (RR)	0.25312	2.18897	22.70260
	CON->CO (FR)	0.05086	0.99597	11.44040

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)	0.30569	2.81331	36.15750
	B->CO (FF)	0.27835	2.71126	35.17060
	CI->CO (FF)	0.27264	2.79839	36.50080
	CON->CO (RF)	0.03628	0.82864	11.11510
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.30789	2.32536	23.42430
	B->CO (FF)	0.28033	2.24767	23.05380
	CI->CO (FF)	0.27476	2.31147	23.80790
	CON->CO (RF)	0.04344	0.85879	9.95902

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)	0.20665	1.10884	10.37250
	B->CON (FR)	0.18264	1.06774	10.39810
	CI->CON (FR)	0.17355	1.09617	10.77550
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.19462	1.09886	10.38230
	B->CON (FR)	0.17127	1.05794	10.40690
	CI->CON (FR)	0.16146	1.08569	10.78500

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)	0.16945	0.95324	9.17484
	B->CON (RF)	0.17076	0.96492	9.43553
	CI->CON (RF)	0.15611	0.98060	9.74979
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.16160	0.94683	9.18424
	B->CON (RF)	0.16317	0.95867	9.44444
	CI->CON (RF)	0.14822	0.97391	9.75851

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)	0.44441	2.52757	27.17650
	B->S (-R)	0.48049	2.56288	26.64360
	CI->S (-R)	0.40901	2.50614	27.50750
	CON->S (RR)	0.12619	0.85360	8.18416
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.43511	2.24704	19.98130
	B->S (-R)	0.42520	2.22473	19.87100
	CI->S (-R)	0.39907	2.22684	20.34850
	CON->S (RR)	0.13741	0.97953	8.22482

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)	0.41472	2.27499	23.30340
	B->S (-F)	0.40883	2.19178	22.79150
	CI->S (-F)	0.40034	2.29409	23.82640
	CON->S (FF)	0.15590	0.88295	7.60040
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.39984	1.96002	16.68250
	B->S (-F)	0.39024	1.89962	16.62390
	CI->S (-F)	0.38508	1.97910	17.23050
	CON->S (FF)	0.15841	0.89562	6.58319

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	0.00265	0.00302	0.00947
	B	0.00416	0.00434	0.01014
	CI	0.00417	0.00461	0.01113
sky130_osu_sc_15T_ms__addf_l	A	0.00247	0.00232	0.00496
	B	0.00341	0.00334	0.00602
	CI	0.00342	0.00361	0.00666

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01070	0.01108	0.01918
	B	0.01135	0.01178	0.01867
	CI	0.00898	0.00941	0.01768
sky130_osu_sc_15T_ms__addf_l	A	0.00998	0.01019	0.01401
	B	0.01061	0.01090	0.01395
	CI	0.00926	0.00970	0.01305

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01149	0.01160	0.01423
	B	0.01107	0.01126	0.01429
	CI	0.00998	0.01043	0.01346
sky130_osu_sc_15T_ms__addf_l	A	0.01079	0.01084	0.01331
	B	0.01036	0.01050	0.01334
	CI	0.00925	0.00967	0.01254

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00319	0.00312	0.00560
	B	0.00412	0.00411	0.00665
	CI	0.00415	0.00440	0.00734
sky130_osu_sc_15T_ms__addf_l	A	0.00245	0.00230	0.00453
	B	0.00338	0.00329	0.00563
	CI	0.00340	0.00357	0.00624

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01070	0.01109	0.01888
	B	0.01134	0.01177	0.01839
	CI	0.00898	0.00939	0.01740
sky130_osu_sc_15T_ms__addf_l	A	0.00998	0.01019	0.01406
	B	0.01061	0.01090	0.01396
	CI	0.00927	0.00971	0.01309

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02373	0.02396	0.02930
	B	0.02139	0.02136	0.02977
	CI	0.01936	0.01943	0.02473
sky130_osu_sc_15T_ms__addf_l	A	0.02276	0.02275	0.02824
	B	0.02042	0.02028	0.02904
	CI	0.01840	0.01839	0.02390

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00800	0.00877	1.46070	0.70727	1.48607
sky130_osu_sc_15T_ms__addh_l	0.00801	0.00877	0.81058	0.70414	0.82213

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.90606	1.03187
sky130_osu_sc_15T_ms__addh_l	0.00000	0.49611	0.70306

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)	0.16544	0.90514	8.19303
	B->CO (RR)	0.17122	0.88876	8.21751
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.17989	1.04018	8.34848
	B->CO (RR)	0.18578	1.02524	8.37029

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)	0.12688	0.82463	7.43887
	B->CO (FF)	0.13389	0.84184	7.49203
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.12685	0.78048	5.69857
	B->CO (FF)	0.13363	0.79762	5.74965

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	0.21946	0.77266	4.72697
	A->CON (FR)	!B	0.11647	1.01770	10.65680
	B->CON (RR)	A	0.22453	0.75465	4.74696
	B->CON (FR)	!A	0.14191	1.02708	10.33740
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.20026	0.74391	4.65089
	A->CON (FR)	!B	0.10522	1.00440	10.61560
	B->CON (RR)	A	0.20546	0.72987	4.66483
	B->CON (FR)	!A	0.13068	1.01382	10.29440

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	0.21378	0.95910	6.66341
	A->CON (RF)	!B	0.09995	0.92513	9.87149
	B->CON (FF)	A	0.20591	0.98581	6.93877
	B->CON (RF)	!A	0.12507	0.93533	9.67713
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.19752	0.92702	6.51330
	A->CON (RF)	!B	0.09240	0.91592	9.83817
	B->CON (FF)	A	0.18961	0.95445	6.78808
	B->CON (RF)	!A	0.11760	0.92648	9.64616

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	0.17043	2.29909	30.80380
	A->S (FR)	B	0.28552	2.32250	27.44580
	B->S (RR)	!A	0.19661	2.28067	30.06100
	B->S (FR)	A	0.27718	2.38058	28.27350
	CON->S (FR)	-	0.03720	0.83848	11.24840
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.18150	2.09613	22.90050
	A->S (FR)	B	0.28830	2.09879	19.45300
	B->S (RR)	!A	0.20800	2.08857	22.45180
	B->S (FR)	A	0.27957	2.14519	19.98220
	CON->S (FR)	-	0.05079	1.00446	11.66230

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	0.19858	2.58066	34.53430
	A->S (RF)	B	0.28447	1.84910	20.63730
	B->S (FF)	!A	0.22415	2.59353	34.28740
	B->S (RF)	A	0.28949	1.83105	20.65290
	CON->S (RF)	-	0.03469	0.81484	10.91650
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.19749	2.16886	23.51180
	A->S (RF)	B	0.27236	1.62227	14.21620
	B->S (FF)	!A	0.22301	2.18294	23.21300
	B->S (RF)	A	0.27758	1.60500	14.23540
	CON->S (RF)	-	0.04150	0.85979	10.08890

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	0.00497	0.00483	0.00703
	B	0.00000	0.00000	0.00000
	B	0.00448	0.00427	0.00641
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00428	0.00407	0.00757
	B	0.00000	0.00000	0.00000
	B	0.00378	0.00352	0.00710

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	0.00776	0.00761	0.01153
	B	0.00000	0.00000	0.00000
	B	0.00800	0.00824	0.01234
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00707	0.00687	0.01025
	B	0.00000	0.00000	0.00000
	B	0.00732	0.00743	0.01089

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	0.00497	0.00483	0.00737
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00676	0.00690	0.00817
	B	A	0.00000	0.00000	0.00000
	B	A	0.00447	0.00428	0.00677
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00760	0.00764	0.00844
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00428	0.00407	0.00685
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00630	0.00637	0.00733
	B	A	0.00000	0.00000	0.00000
	B	A	0.00377	0.00351	0.00611
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00714	0.00712	0.00759

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	0.00776	0.00762	0.01111
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00118	0.00124	0.00216
	B	A	0.00000	0.00000	0.00000
	B	A	0.00800	0.00820	0.01198
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00191	0.00184	0.00279
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00708	0.00687	0.01035
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00052	0.00052	0.00102
	B	A	0.00000	0.00000	0.00000
	B	A	0.00732	0.00743	0.01094
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00125	0.00113	0.00165

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	0.00777	0.00763	0.01174
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00120	0.00133	0.00277
	B	A	0.00000	0.00000	0.00000
	B	A	0.00801	0.00825	0.01259
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00194	0.00193	0.00328
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00709	0.00687	0.01041
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00053	0.00053	0.00107
	B	A	0.00000	0.00000	0.00000
	B	A	0.00733	0.00744	0.01097
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00127	0.00114	0.00164

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	0.00498	0.00483	0.00716
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00677	0.00695	0.00840
	B	A	0.00000	0.00000	0.00000
	B	A	0.00448	0.00428	0.00668
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00762	0.00775	0.00892
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00427	0.00407	0.00683
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00630	0.00638	0.00724
	B	A	0.00000	0.00000	0.00000
	B	A	0.00378	0.00352	0.00607
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00715	0.00715	0.00759

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00429	0.00439	1.47280
sky130_osu_sc_15T_ms__and2_2	0.00429	0.00440	2.91358
sky130_osu_sc_15T_ms__and2_4	0.00429	0.00440	5.57012
sky130_osu_sc_15T_ms__and2_6	0.00432	0.00440	8.29390
sky130_osu_sc_15T_ms__and2_8	0.00430	0.00441	10.69177
sky130_osu_sc_15T_ms__and2_l	0.00317	0.00328	0.79349

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.42841	0.67864
sky130_osu_sc_15T_ms__and2_2	0.00000	0.67893	0.67984
sky130_osu_sc_15T_ms__and2_4	0.00000	1.18613	1.35407
sky130_osu_sc_15T_ms__and2_6	0.00000	1.69332	2.02854
sky130_osu_sc_15T_ms__and2_8	0.00000	2.20051	2.70301
sky130_osu_sc_15T_ms__and2_l	0.00000	0.01868	0.02525

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)	0.12492	0.81699	7.94462
	B->Y (RR)	0.13336	0.81317	7.92749
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.14621	0.77957	8.18132
	B->Y (RR)	0.15465	0.76583	8.14278
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.20297	0.82138	8.51215
	B->Y (RR)	0.21140	0.79613	8.46051
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.25865	0.88339	8.91197
	B->Y (RR)	0.26698	0.85582	8.83209
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.31277	0.94628	9.12818
	B->Y (RR)	0.32121	0.91839	9.00565
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.16534	1.01948	8.25449
	B->Y (RR)	0.17503	1.01251	8.25607

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)	0.09808	0.73868	7.02220
	B->Y (FF)	0.10277	0.75699	7.08511
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.11180	0.69898	7.22496
	B->Y (FF)	0.11695	0.71310	7.28530
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.15532	0.72583	7.48946
	B->Y (FF)	0.16008	0.73583	7.55606
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.20148	0.77878	7.84541
	B->Y (FF)	0.20565	0.78633	7.89992
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.24471	0.82682	7.92995
	B->Y (FF)	0.24863	0.83137	7.99026
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.12751	0.84788	6.37863
	B->Y (FF)	0.13560	0.87000	6.46889

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	0.00380	0.00364	0.01364
	B	0.00000	0.00000	0.00000
	B	0.00387	0.00340	0.01035
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00750	0.00759	0.01674
	B	0.00000	0.00000	0.00000
	B	0.00757	0.00742	0.01385
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01576	0.01624	0.02443
	B	0.00000	0.00000	0.00000
	B	0.01589	0.01608	0.02202
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02440	0.02496	0.03331
	B	0.00000	0.00000	0.00000
	B	0.02456	0.02472	0.03126
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03364	0.03347	0.04093
	B	0.00000	0.00000	0.00000
	B	0.03341	0.03322	0.03948
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00272	0.00250	0.00691
	B	0.00000	0.00000	0.00000
	B	0.00280	0.00238	0.00542

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	0.00939	0.00977	0.02052
	B	0.00000	0.00000	0.00000
	B	0.01058	0.01088	0.02096
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01168	0.01263	0.02313
	B	0.00000	0.00000	0.00000
	B	0.01290	0.01367	0.02362
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01751	0.01946	0.02993
	B	0.00000	0.00000	0.00000
	B	0.01877	0.02035	0.03019
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02364	0.02631	0.03692
	B	0.00000	0.00000	0.00000
	B	0.02483	0.02703	0.03703
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02972	0.03320	0.04381
	B	0.00000	0.00000	0.00000
	B	0.03101	0.03344	0.04363
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00700	0.00703	0.01178
	B	0.00000	0.00000	0.00000
	B	0.00781	0.00777	0.01220

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)	-0.00350	-0.00351	-0.00352
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00349	-0.00351	-0.00352
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00348	-0.00350	-0.00351
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00350	-0.00352	-0.00353
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00347	-0.00349	-0.00350
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00241	-0.00243	-0.00243

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)	0.00353	0.00355	0.00354
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00353	0.00356	0.00354
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00353	0.00356	0.00355
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00356	0.00359	0.00358
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00355	0.00357	0.00356
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00243	0.00245	0.00244

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)	-0.00333	-0.00336	-0.00335
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00333	-0.00336	-0.00335
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00333	-0.00335	-0.00334
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00332	-0.00335	-0.00333
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00332	-0.00334	-0.00333
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00232	-0.00233	-0.00232

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)	0.00338	0.00342	0.00336
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00338	0.00342	0.00337
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00339	0.00342	0.00337
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00340	0.00343	0.00338
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00340	0.00343	0.00338
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00234	0.00233	0.00233

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00406	0.00422	0.00407	0.65364

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.17907	0.35472

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)	0.11058	1.02015	10.29090
	A1->Y (FR)	0.09382	0.97153	9.98276
	B0->Y (FR)	0.08108	1.00904	10.69490

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)	0.09429	0.85033	8.73711
	A1->Y (RF)	0.08692	0.87394	9.24517
	B0->Y (RF)	0.05258	0.81295	9.07504

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	0.00830	0.00824	0.00898
	A1	0.00000	0.00000	0.00000
	A1	0.00705	0.00696	0.00770
	B0	0.00653	0.00650	0.00771

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	0.00190	0.00157	0.00222
	A1	0.00000	0.00000	0.00000
	A1	0.00193	0.00165	0.00253
	B0	-0.00085	-0.00091	-0.00026

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)	-0.00258	-0.00305	-0.00309
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00311	-0.00314	-0.00312
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00312	-0.00314	-0.00313

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)	0.00307	0.00310	0.00309
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00312	0.00315	0.00314
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00315	0.00317	0.00313

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)	-0.00255	-0.00301	-0.00304
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00307	-0.00309	-0.00308
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00330	-0.00329	-0.00333

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)	0.00301	0.00303	0.00304
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00307	0.00310	0.00309
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00332	0.00335	0.00334

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)	-0.00150	-0.00151	-0.00151

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)	0.00166	0.00167	0.00155

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00405	0.00420	0.00435	0.00415	0.66248

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi22_1	0.00000	0.20014	0.67445

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)	0.13545	1.04345	10.28460
	A1->Y (FR)	0.12125	1.02003	10.20020
	B0->Y (FR)	0.08286	0.99588	10.58130
	B1->Y (FR)	0.09708	1.02374	10.70830

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)	0.12631	0.88788	8.84254
	A1->Y (RF)	0.11882	0.91188	9.34443
	B0->Y (RF)	0.06160	0.84595	9.28537
	B1->Y (RF)	0.06916	0.82371	8.78266

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	0.01013	0.01003	0.01076
	A1	0.00887	0.00865	0.00952
	B0	0.00700	0.00697	0.00873
	B1	0.00819	0.00815	0.00995

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00390	0.00356	0.00419
	A1	0.00391	0.00360	0.00449
	B0	-0.00059	-0.00064	0.00031
	B1	-0.00051	-0.00067	0.00005

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)	-0.00254	-0.00304	-0.00309
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00311	-0.00314	-0.00312
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00312	-0.00314	-0.00312
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00312	-0.00314	-0.00312

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)	0.00307	0.00309	0.00309
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00312	0.00315	0.00314
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00315	0.00317	0.00313
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00315	0.00317	0.00313

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)	-0.00252	-0.00300	-0.00304
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00307	-0.00309	-0.00307
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00329	-0.00331	-0.00332
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00329	-0.00331	-0.00332

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)	0.00301	0.00305	0.00304
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00308	0.00310	0.00309
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00331	0.00335	0.00333
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00331	0.00335	0.00333

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)	-0.00150	-0.00152	-0.00151
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00149	-0.00151	-0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00339	-0.00341	-0.00343
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00339	-0.00341	-0.00343

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)	0.00174	0.00175	0.00157
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00150	0.00151	0.00151
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00342	0.00348	0.00344
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00342	0.00348	0.00344

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)	-0.00152	-0.00153	-0.00152
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00151	-0.00152	-0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00317	-0.00320	-0.00318
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00317	-0.00320	-0.00318

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)	0.00175	0.00176	0.00158
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00152	0.00153	0.00152
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00321	0.00321	0.00319
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00321	0.00321	0.00319

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00439	1.44985
sky130_osu_sc_15T_ms__buf_2	0.00442	2.87598
sky130_osu_sc_15T_ms__buf_4	0.00442	5.57951
sky130_osu_sc_15T_ms__buf_6	0.00092	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00442	10.83031
sky130_osu_sc_15T_ms__buf_l	0.00330	0.78952

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.34501	0.34501
sky130_osu_sc_15T_ms__buf_2	0.00000	0.51243	0.67864
sky130_osu_sc_15T_ms__buf_4	0.00000	0.85234	1.35311
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	1.53218	2.70205
sky130_osu_sc_15T_ms__buf_l	0.00000	0.01620	0.01620

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)**	0.08636	0.75894	7.73886
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.09907	0.70401	7.88442
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.13418	0.72133	8.24808
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.20170	0.80074	8.80671
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.11257	0.94232	7.99224

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)**	0.09336	0.72187	6.90929
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.10895	0.70339	7.38806
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.15286	0.73441	7.84386
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.24259	0.83506	8.39090
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.12336	0.83603	6.32181

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	0.00360	0.00334	0.01197
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00725	0.00719	0.01537
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01542	0.01585	0.02338
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03208	0.03302	0.04105
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00268	0.00236	0.00649

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	0.00910	0.00943	0.02024
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01145	0.01222	0.02241
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01731	0.01898	0.02909
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02956	0.03223	0.04252
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00686	0.00682	0.01163

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
	-0.00058	-0.00059	-0.00057

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
	0.00058	0.00059	0.00057

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00416	0.00415	0.01209	1.36665	1.36836
sky130_osu_sc_15T_ms__dffr_l	0.00416	0.00415	0.01209	0.78933	0.78859

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.99844	1.75275
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.66963	1.42394

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)	0.53441	1.99497	18.52280
	QN->Q (FR)	0.04249	0.93793	12.36020
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.54431	2.22743	17.97740
	QN->Q (FR)	0.05470	1.06315	12.22810

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)	0.48176	2.01869	19.77960
	QN->Q (RF)	0.03994	0.87613	11.51000
	RN->Q (FF)	0.34986	1.88756	19.41960
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.51350	2.31147	19.36190
	QN->Q (RF)	0.04570	0.90789	10.53970
	RN->Q (FF)	0.38303	2.18273	18.99090

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)	0.42021	1.14102	8.14100
	RN->QN (FR)	0.28805	1.00977	7.78047
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.43496	1.28165	8.36487
	RN->QN (FR)	0.30357	1.15096	7.99575

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)**	0.46979	1.16809	7.58967
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.45821	1.17919	6.81478

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)	-0.14197	-0.14833	-0.31760
	setup	CK (R)	0.43066	0.42922	1.00346
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.14372	-0.15122	-0.31625
	setup	CK (R)	0.42585	0.43047	1.00615

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)	-0.17526	-0.42034	-2.14724
	setup	CK (R)	0.21760	0.43781	2.17418
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.17651	-0.42025	-2.14680
	setup	CK (R)	0.21760	0.43781	2.17418

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)	-0.14197	-0.14833	-0.31760
	setup	CK (R)	0.43066	0.42922	1.00346
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.14372	-0.15122	-0.31625
	setup	CK (R)	0.42585	0.43047	1.00615

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)	-0.17526	-0.42034	-2.14724
	setup	CK (R)	0.21760	0.43781	2.17418
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.17651	-0.42025	-2.14680
	setup	CK (R)	0.21760	0.43781	2.17418

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)	0.35172	0.36585	1.10976
	removal	CK (R)	-0.09653	-0.11058	-0.21388
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.35018	0.36416	1.10932
	removal	CK (R)	-0.09627	-0.10810	-0.21755

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)	0.35172	0.36585	1.10976
	removal	CK (R)	-0.09653	-0.11058	-0.21388
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.35018	0.36416	1.10932
	removal	CK (R)	-0.09627	-0.10810	-0.21755

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 ()	0.20447	0.55054	13.33370
	min_pulse_width	RN ()	0.20447	0.55054	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.20859	0.55054	13.33370
	min_pulse_width	RN ()	0.20653	0.55054	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.26627	0.55054	13.33370
	min_pulse_width	CK ()	0.26215	0.55054	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.24567	0.55054	13.33370
	min_pulse_width	CK ()	0.25391	0.55054	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffr_1	min_pulse_width	CK ()	0.51346	0.55054	13.33370
	min_pulse_width	CK ()	0.18799	0.55054	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.51140	0.55054	13.33370
	min_pulse_width	CK ()	0.18593	0.55054	13.33370

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	0.00915	0.00796	0.00319
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00718	0.01074

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	0.01046	0.00885	-0.00319
	RN	-0.00121	-0.06289	-0.87465
	RN	0.02386	0.02246	0.01003
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00930	0.00842	0.00730
	RN	-0.00121	-0.04524	-0.50517
	RN	0.02269	0.02200	0.02131

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	0.01045	0.00885	-0.00309
	RN	-0.00121	-0.06294	-0.87549
	RN	0.02385	0.02242	0.00982
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00929	0.00841	0.00739
	RN	-0.00121	-0.04522	-0.50465
	RN	0.02268	0.02196	0.02127

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	0.00911	0.00794	0.00309
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00796	0.00715	0.01056

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	-0.00250	-0.00299	-0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01107	0.01043	0.01601
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00477	0.00419	0.00999
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00251	-0.00299	-0.00306
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01106	0.01043	0.01601
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00477	0.00419	0.00999

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	0.00307	0.00309	0.00309
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01845	0.01815	0.02446
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00881	0.00858	0.01482
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00306	0.00309	0.00309
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01845	0.01815	0.02446
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00881	0.00857	0.01482

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)	0.00328	0.00297	0.01282
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00982	0.00928	0.01898
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)	0.00328	0.00297	0.01282
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00981	0.00927	0.01898

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)	0.00856	0.00861	0.01991
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01804	0.01772	0.02879
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)	0.00855	0.00861	0.01991
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01803	0.01771	0.02879

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)	-0.00072	-0.00127	0.00844
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00521	0.00429	0.01414
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00105	-0.00161	0.00808
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00073	-0.00127	0.00844
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00521	0.00429	0.01414
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00105	-0.00161	0.00808

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)	0.01333	0.01340	0.02463
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02841	0.02769	0.03895
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02167	0.02138	0.03214
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02804	0.02798	0.04833
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01510	0.01509	0.02609
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01333	0.01340	0.02463
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02841	0.02769	0.03894
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02166	0.02138	0.03214
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02803	0.02798	0.04833
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01510	0.01509	0.02608

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00412	0.00415	0.00911	0.01243	1.49682	1.49843
sky130_osu_sc_15T_ms__dffsr_l	0.00412	0.00415	0.00910	0.01243	0.78684	0.78938

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__dffsr_1	0.00000	1.29570	1.75894
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.96688	1.43013

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)	0.47969	1.96943	19.58010
	QN->Q (FR)	0.03775	0.88192	11.89590
	RN->Q (RR)	0.38474	1.89619	19.57430
	SN->Q (FR)	0.33950	1.84620	19.51500
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.50489	2.18628	17.89570
	QN->Q (FR)	0.05468	1.06285	12.19270
	RN->Q (RR)	0.41049	2.11363	17.89120
	SN->Q (FR)	0.36478	2.06267	17.81220

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)	0.55434	2.11551	20.72890
	QN->Q (RF)	0.03947	0.90497	12.17950
	RN->Q (FF)	0.36357	1.92958	20.36630
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.59522	2.39882	19.39850
	QN->Q (RF)	0.04561	0.90621	10.51590
	RN->Q (FF)	0.40541	2.21449	19.03290

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)	0.49266	1.21521	8.33241
	RN->QN (FR)	0.30258	1.03024	7.97619
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.51489	1.37146	8.46683
	RN->QN (FR)	0.32556	1.18569	8.10503

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)	0.42164	1.13925	8.13869
	RN->QN (RF)	0.32698	1.06670	8.13799
	SN->QN (FF)	0.28188	1.01712	8.07375
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.42247	1.14267	6.79790
	RN->QN (RF)	0.32802	1.07111	6.78921
	SN->QN (FF)	0.28267	1.01922	6.70867

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)	-0.13326	-0.14626	-0.35507
	setup	CK (R)	0.36606	0.37068	1.03908
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13359	-0.14554	-0.35441
	setup	CK (R)	0.36255	0.36595	1.03412

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)	-0.20244	-0.44643	-2.27186
	setup	CK (R)	0.26565	0.46162	2.29555
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.20323	-0.44347	-2.27246
	setup	CK (R)	0.26384	0.46162	2.29415

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)	-0.13326	-0.14626	-0.35507
	setup	CK (R)	0.36606	0.37068	1.03908
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.13359	-0.14554	-0.35441
	setup	CK (R)	0.36255	0.36595	1.03412

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)	-0.20244	-0.44643	-2.27186
	setup	CK (R)	0.26565	0.46162	2.29555
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.20323	-0.44347	-2.27246
	setup	CK (R)	0.26384	0.46162	2.29415

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)	0.26433	0.27973	1.03230
	removal	CK (R)	-0.03457	-0.04048	-0.09693
	hold	SN (R)	-0.27584	-0.50040	-2.15525
	setup	SN (R)	0.31072	0.55455	3.88705
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.26202	0.27924	1.02663
	removal	CK (R)	-0.03457	-0.04048	-0.09693
	hold	SN (R)	-0.27392	-0.49238	-2.09157
	setup	SN (R)	0.30959	0.55153	3.81832

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)	0.26433	0.27973	1.03230
	removal	CK (R)	-0.03457	-0.04048	-0.09693
	hold	SN (R)	-0.27763	-0.50040	-2.15525
	hold	SN (R)	-0.27584	-0.50040	-2.16618
	setup	SN (R)	0.31072	0.55190	3.74350
	setup	SN (R)	0.30851	0.55455	3.88705
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.26202	0.27924	1.02663
	removal	CK (R)	-0.03457	-0.04048	-0.09693
	hold	SN (R)	-0.27575	-0.49238	-2.09157
	hold	SN (R)	-0.27392	-0.49482	-2.10452
	setup	SN (R)	0.30959	0.54586	3.65291
	setup	SN (R)	0.29712	0.55153	3.81832

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 ()	0.23743	0.55054	13.33370
	min_pulse_width	RN ()	0.24155	0.55054	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.23949	0.55054	13.33370
	min_pulse_width	RN ()	0.23743	0.55054	13.33370

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)	0.08268	0.11825	2.70051
	removal	CK (R)	-0.03417	-0.08717	-0.46945
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.07849	0.11825	2.59479
	removal	CK (R)	-0.03417	-0.08717	-0.46842

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)	0.08268	0.11825	2.70051
	removal	CK (R)	-0.03417	-0.08717	-0.46945
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.07849	0.11825	2.59479
	removal	CK (R)	-0.03417	-0.08717	-0.46842

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 ()	0.26215	0.55054	13.33370
	min_pulse_width	SN ()	0.26627	0.55054	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.26215	0.55054	13.33370
	min_pulse_width	SN ()	0.25391	0.55054	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.22301	0.55054	13.33370
	min_pulse_width	CK ()	0.27863	0.55054	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.21477	0.55054	13.33370
	min_pulse_width	CK ()	0.27245	0.55054	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffsr_1	min_pulse_width	CK ()	0.45166	0.55054	13.33370
	min_pulse_width	CK ()	0.23949	0.55054	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.44960	0.55054	13.33370
	min_pulse_width	CK ()	0.23743	0.55054	13.33370

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	0.01152	0.01024	0.00374
	RN	0.02112	0.02000	0.00985
	SN	-0.00121	-0.06642	-0.95796
	SN	0.02341	0.02215	0.01242
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01047	0.00967	0.01297
	RN	0.02007	0.01941	0.01934
	SN	-0.00121	-0.04516	-0.50358
	SN	0.02236	0.02158	0.02190

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	0.01227	0.01136	0.00519
	RN	-0.00121	-0.06642	-0.95796
	RN	0.02491	0.02392	0.01829
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01119	0.01041	0.00933
	RN	-0.00121	-0.04516	-0.50357
	RN	0.02380	0.02294	0.02255

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	0.01225	0.01134	0.00504
	RN	-0.00121	-0.06646	-0.95832
	RN	0.02488	0.02390	0.01813
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01118	0.01040	0.00933
	RN	-0.00121	-0.04524	-0.50515
	RN	0.02378	0.02293	0.02241

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	0.01148	0.01021	0.00371
	RN	0.02108	0.01995	0.00985
	SN	-0.00121	-0.06646	-0.95893
	SN	0.02338	0.02212	0.01230
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01043	0.00964	0.01289
	RN	0.02003	0.01937	0.01917
	SN	-0.00121	-0.04524	-0.50515
	SN	0.02232	0.02154	0.02169

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	-0.00301	-0.00305	-0.00306
	(!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)	0.01438	0.01379	0.01934
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00554	0.00498	0.01065
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00553	0.00498	0.01069
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00558	0.00504	0.01069
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00301	-0.00305	-0.00306
	(!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)	0.01437	0.01378	0.01934
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00553	0.00498	0.01064
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00553	0.00498	0.01068
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00558	0.00503	0.01069

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	0.00309	0.00308	0.00306
	(!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)	0.02139	0.02107	0.02700
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00938	0.00920	0.01537
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00953	0.00929	0.01538
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00933	0.00915	0.01532
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00308	0.00308	0.00306
	(!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)	0.02137	0.02106	0.02699
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00937	0.00919	0.01536
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00952	0.00927	0.01537
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00932	0.00914	0.01531

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)	0.00308	0.00264	0.01234
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01216	0.01151	0.02112
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)	0.00308	0.00264	0.01234
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01216	0.01151	0.02113

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)	0.00921	0.00934	0.02070
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01910	0.01868	0.02984
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)	0.00919	0.00932	0.02069
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01908	0.01866	0.02983

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)	-0.00693	-0.00697	-0.00698
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00645	-0.00730	-0.00736
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00657	-0.00701	-0.00702
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00475	0.00431	0.01043
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)	-0.00693	-0.00697	-0.00699
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00643	-0.00729	-0.00735
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00657	-0.00701	-0.00702
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00475	0.00431	0.01044

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)	0.00699	0.00707	0.00703
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00735	0.00741	0.00741
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00703	0.00711	0.00707
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01490	0.01457	0.02019
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)	0.00699	0.00706	0.00703
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00733	0.00739	0.00739
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00702	0.00710	0.00706
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01489	0.01455	0.02018

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)	-0.00072	-0.00127	0.00843
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00607	0.00519	0.01502
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00588	0.00502	0.01492
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00088	-0.00144	0.00824
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00394	0.00278	0.02171
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00072	-0.00127	0.00843
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00606	0.00518	0.01501
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00587	0.00501	0.01491
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00088	-0.00145	0.00824
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00393	0.00277	0.02171

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)	0.03194	0.03126	0.04255
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01337	0.01344	0.02467
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02221	0.02203	0.03298
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02226	0.02208	0.03292
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03092	0.03063	0.05089
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01498	0.01498	0.02597
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01790	0.01795	0.03930
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03194	0.03126	0.04255
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01337	0.01344	0.02467
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02221	0.02203	0.03298
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02226	0.02208	0.03292
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03091	0.03062	0.05091
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01498	0.01498	0.02597
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01789	0.01794	0.03929

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00415	0.00706	0.01221	1.38437	1.37459
sky130_osu_sc_15T_ms__dffs_l	0.00415	0.00706	0.01221	0.78764	0.79104

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.87279	1.41277
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.54398	1.08396

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)	0.40050	1.84486	18.55350
	QN->Q (FR)	0.04246	0.93900	12.40560
	SN->Q (FR)	0.29838	1.84129	18.83680
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.41836	2.08197	17.78340
	QN->Q (FR)	0.05467	1.06183	12.18240
	SN->Q (FR)	0.31549	2.07232	18.01090

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)	0.56990	2.13337	20.08120
	QN->Q (RF)	0.03974	0.87785	11.56370
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.60042	2.40869	19.39370
	QN->Q (RF)	0.04553	0.90493	10.50820

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)	0.50355	1.24662	8.25307
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.51735	1.37993	8.46626

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)	0.34222	1.01414	7.46039
	SN->QN (FF)	0.23983	1.01137	7.74397
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.33901	1.03959	6.68871
	SN->QN (FF)	0.23529	1.03027	6.91600

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)	-0.11342	-0.12795	-0.29384
	setup	CK (R)	0.29933	0.31473	0.95951
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.11237	-0.12782	-0.29232
	setup	CK (R)	0.29669	0.31209	0.95953

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)	-0.18905	-0.42337	-2.17153
	setup	CK (R)	0.27112	0.44369	2.19819
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.18759	-0.42348	-2.16994
	setup	CK (R)	0.26852	0.44369	2.19819

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)	-0.11342	-0.12795	-0.29384
	setup	CK (R)	0.29933	0.31473	0.95951
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.11237	-0.12782	-0.29232
	setup	CK (R)	0.29669	0.31209	0.95953

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)	-0.18905	-0.42337	-2.17153
	setup	CK (R)	0.27112	0.44369	2.19819
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.18759	-0.42348	-2.16994
	setup	CK (R)	0.26852	0.44369	2.19819

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)	0.10918	0.14637	1.84526
	removal	CK (R)	-0.04832	-0.10906	-0.50353
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.10313	0.14458	1.76558
	removal	CK (R)	-0.04798	-0.10875	-0.50282

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)	0.10918	0.14637	1.84526
	removal	CK (R)	-0.04832	-0.10906	-0.50353
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.10313	0.14458	1.76558
	removal	CK (R)	-0.04798	-0.10875	-0.50282

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 ()	0.20241	0.55054	13.33370
	min_pulse_width	SN ()	0.20859	0.55054	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.20241	0.55054	13.33370
	min_pulse_width	SN ()	0.20035	0.55054	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.18799	0.55054	13.33370
	min_pulse_width	CK ()	0.28892	0.55054	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.17975	0.55054	13.33370
	min_pulse_width	CK ()	0.27657	0.55054	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dffs_1	min_pulse_width	CK ()	0.38574	0.55054	13.33370
	min_pulse_width	CK ()	0.24979	0.55054	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.38368	0.55054	13.33370
	min_pulse_width	CK ()	0.24773	0.55054	13.33370

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	0.00914	0.00790	0.00316
	SN	-0.00121	-0.06338	-0.88600
	SN	0.01952	0.01825	0.00920
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00800	0.00713	0.01083
	SN	-0.00121	-0.04518	-0.50409
	SN	0.01836	0.01746	0.01637

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	0.01037	0.00886	-0.00316
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00921	0.00841	0.00748

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	0.01036	0.00886	-0.00329
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00920	0.00840	0.00744

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	0.00911	0.00788	0.00329
	SN	-0.00121	-0.06311	-0.87967
	SN	0.01948	0.01822	0.00907
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00796	0.00710	0.01050
	SN	-0.00121	-0.04530	-0.50622
	SN	0.01832	0.01741	0.01652

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	-0.00306	-0.00310	-0.00310
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01057	0.00993	0.01556
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00467	0.00410	0.00988
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00306	-0.00310	-0.00309
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01056	0.00993	0.01556
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00467	0.00410	0.00987

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	0.00312	0.00312	0.00310
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01805	0.01769	0.02384
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00894	0.00874	0.01503
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00312	0.00311	0.00309
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01804	0.01769	0.02384
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00893	0.00874	0.01503

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)	-0.00488	-0.00491	-0.00492
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00392	0.00344	0.00697
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)	-0.00488	-0.00491	-0.00492
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00391	0.00343	0.00696

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)	0.00495	0.00500	0.00495
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01017	0.00980	0.01386
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)	0.00495	0.00500	0.00495
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01017	0.00981	0.01386

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)	-0.00075	-0.00130	0.00842
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00101	-0.00157	0.00813
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00302	0.00187	0.02113
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00130	0.00842
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00101	-0.00157	0.00812
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00302	0.00187	0.02113

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)	0.02810	0.02739	0.03880
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01334	0.01342	0.02465
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02753	0.02732	0.04767
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01505	0.01504	0.02604
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01739	0.01753	0.03906
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02810	0.02739	0.03880
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01334	0.01341	0.02465
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02753	0.02732	0.04767
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01504	0.01503	0.02603
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01739	0.01753	0.03906

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00431	0.01208	1.49625	1.50785
sky130_osu_sc_15T_ms__dff_l	0.00431	0.01208	0.74031	0.73771

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	1.15031	1.41549
sky130_osu_sc_15T_ms__dff_l	0.00000	0.82150	1.08667

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)	0.31902	1.77954	19.33090
	QN->Q (FR)	0.03755	0.87889	11.86030
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.35042	1.98978	17.08850
	QN->Q (FR)	0.05983	1.11633	12.59990

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)	0.44139	1.98559	20.55290
	QN->Q (RF)	0.03932	0.90273	12.15410
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.48747	2.28271	18.85510
	QN->Q (RF)	0.04569	0.88655	10.16750

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)	0.38324	1.09015	8.22403
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.40853	1.26299	8.27031

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)	0.26664	0.95439	7.96015
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.27128	0.94617	6.23657

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)	-0.09455	-0.11266	-0.27129
	setup	CK (R)	0.22357	0.24138	0.95162
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.09597	-0.11687	-0.27219
	setup	CK (R)	0.21965	0.23428	0.94398

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)	-0.16429	-0.42519	-2.19555
	setup	CK (R)	0.19556	0.43706	2.21819
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.16386	-0.42470	-2.19770
	setup	CK (R)	0.19713	0.43706	2.22074

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 ()	0.15091	0.55054	13.33370
	min_pulse_width	CK ()	0.24567	0.55054	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.14473	0.55054	13.33370
	min_pulse_width	CK ()	0.23743	0.55054	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_15T_ms__dff_1	**min_pulse_width**	**CK ()**	0.30746	0.55054	13.33370
	min_pulse_width	**CK ()**	0.16121	0.55054	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.30334	0.55054	13.33370
	min_pulse_width	**CK ()**	0.15915	0.55054	13.33370

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	0.00977	0.00842	0.00219
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00874	0.00789	0.01186

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	0.01061	0.00966	0.00394
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00952	0.00838	0.00451

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	0.01060	0.00965	0.00359
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00952	0.00838	0.00454

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	0.00974	0.00839	0.00197
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00870	0.00786	0.01174

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	-0.00250	-0.00299	-0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01023	0.00966	0.01570
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00250	-0.00299	-0.00305
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01023	0.00966	0.01570

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	0.00306	0.00308	0.00308
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01871	0.01831	0.02473
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00305	0.00308	0.00307
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01871	0.01832	0.02473

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)	-0.00075	-0.00129	0.00844
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00099	-0.00155	0.00816
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00075	-0.00129	0.00844
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00099	-0.00155	0.00816

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)	0.01327	0.01334	0.02459
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02776	0.02712	0.03876
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02797	0.02775	0.04839
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01497	0.01496	0.02597
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01326	0.01333	0.02459
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02776	0.02710	0.03876
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02797	0.02776	0.04839
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01497	0.01496	0.02596

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00420	1.41425
sky130_osu_sc_15T_ms__inv_10	0.03893	13.06159
sky130_osu_sc_15T_ms__inv_2	0.00798	2.78952
sky130_osu_sc_15T_ms__inv_3	0.01188	4.05723
sky130_osu_sc_15T_ms__inv_4	0.01569	5.45069
sky130_osu_sc_15T_ms__inv_6	0.02351	8.05538
sky130_osu_sc_15T_ms__inv_8	0.03122	10.47361
sky130_osu_sc_15T_ms__inv_l	0.00306	0.71383

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.17251	0.34084
sky130_osu_sc_15T_ms__inv_10	0.00000	1.69959	3.37234
sky130_osu_sc_15T_ms__inv_2	0.00000	0.33992	0.67447
sky130_osu_sc_15T_ms__inv_3	0.00000	0.51242	1.01531
sky130_osu_sc_15T_ms__inv_4	0.00000	0.67984	1.34894
sky130_osu_sc_15T_ms__inv_6	0.00000	1.01975	2.02341
sky130_osu_sc_15T_ms__inv_8	0.00000	1.35967	2.69787
sky130_osu_sc_15T_ms__inv_l	0.00000	0.00810	0.01389

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)**	0.03621	0.82207	10.91030
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.04572	0.54809	10.82890
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02871	0.70446	10.81240
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.03109	0.65946	10.84930
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.03117	0.62545	10.83300
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.03448	0.58679	10.82640
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03969	0.56034	10.72980
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.05391	0.99491	11.14680

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)**	0.03599	0.81423	10.80230
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.04693	0.55271	10.72040
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.02866	0.70367	10.74470
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.03085	0.66511	10.84720
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.03021	0.63085	10.82910
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.03564	0.59375	10.82800
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.04112	0.56780	10.71590
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.04289	0.82496	9.45129

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	0.00486	0.00499	0.00630
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04139	0.04553	0.05827
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00859	0.00905	0.01171
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01318	0.01393	0.01793
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01689	0.01836	0.02333
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02508	0.02658	0.03501
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03326	0.03606	0.04690
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00356	0.00356	0.00419

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	-0.00103	-0.00100	-0.00030
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01732	-0.01567	-0.00678
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00323	-0.00294	-0.00150
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00431	-0.00391	-0.00165
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00662	-0.00612	-0.00284
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.01014	-0.00918	-0.00418
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01377	-0.01200	-0.00556
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00059	-0.00064	-0.00032

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.28748	0.28754	0.00857	0.29457

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.34975	0.35051

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)	-	0.02296	0.39471	3.82324
	A1->Y (RR)	-	0.02544	0.39789	3.82939
	S0->Y (RR)	(!A0 * A1)	0.07662	0.44692	2.35504
	S0->Y (FR)	(A0 * !A1)	0.04443	0.47156	3.51720

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)	-	0.02388	0.39288	3.76865
	A1->Y (FF)	-	0.02138	0.38964	3.76111
	S0->Y (FF)	(!A0 * A1)	0.08699	0.44574	2.04153
	S0->Y (RF)	(A0 * !A1)	0.03997	0.47921	3.78929

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	-	-0.00479	-0.00479	-0.00479
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00334	-0.00334	-0.00335
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00585	0.00604	0.01809
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00337	-0.00376	0.00690

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	-	0.00479	0.00480	0.00479
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00337	0.00337	0.00337
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00092	0.00060	0.01157
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01287	0.01301	0.02462

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)	-0.00119	-0.00119	-0.00119

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)	0.00119	0.00119	0.00119

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)	-0.00141	-0.00142	-0.00142

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)	0.00141	0.00142	0.00142

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)	-0.00125	-0.00161	0.00924
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00121	-0.00161	0.00931

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)	0.00981	0.01000	0.02161
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00891	0.00918	0.02106

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00420	0.00418	0.92281
sky130_osu_sc_15T_ms__nand2_l	0.00306	0.00306	0.56396

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.17174	0.67447
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.00768	0.02294

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)	0.03757	0.72007	8.67857
	B->Y (FR)	0.04364	0.71899	8.59386
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.05544	0.91726	9.77957
	B->Y (FR)	0.06475	0.92540	9.77243

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)	0.05867	0.96396	11.40820
	B->Y (RF)	0.06651	0.93971	10.93260
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.07500	1.10589	11.47200
	B->Y (RF)	0.08283	1.08196	10.96030

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	0.00515	0.00502	0.00691
	B	0.00000	0.00000	0.00000
	B	0.00641	0.00621	0.00805
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00373	0.00373	0.00431
	B	0.00000	0.00000	0.00000
	B	0.00457	0.00453	0.00513

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	-0.00071	-0.00080	0.00001
	B	0.00000	0.00000	0.00000
	B	-0.00065	-0.00080	-0.00021
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00042	-0.00051	-0.00018
	B	0.00000	0.00000	0.00000
	B	-0.00039	-0.00051	-0.00029

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)	-0.00343	-0.00345	-0.00346
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00232	-0.00233	-0.00234

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)	0.00346	0.00348	0.00347
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00234	0.00236	0.00235

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)	-0.00322	-0.00324	-0.00322
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00219	-0.00219	-0.00219

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)	0.00325	0.00327	0.00323
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00220	0.00222	0.00219

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00417	0.00446	0.71714
sky130_osu_sc_15T_ms__nor2_l	0.00296	0.00328	0.39161

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.13867	0.34084
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.00773	0.01389

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)	0.08220	0.97743	10.43590
	B->Y (FR)	0.06403	0.97635	10.75430
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.11261	1.18531	10.64670
	B->Y (FR)	0.09458	1.17316	10.93110

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)	0.05031	0.68439	7.72623
	B->Y (RF)	0.03855	0.66843	7.70475
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.05530	0.70893	7.22377
	B->Y (RF)	0.04532	0.69546	7.20367

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	0.00685	0.00679	0.00764
	B	0.00000	0.00000	0.00000
	B	0.00527	0.00528	0.00722
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00475	0.00468	0.00504
	B	0.00000	0.00000	0.00000
	B	0.00381	0.00362	0.00452

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	0.00081	0.00059	0.00156
	B	0.00000	0.00000	0.00000
	B	-0.00079	-0.00076	0.00018
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00048	0.00033	0.00078
	B	0.00000	0.00000	0.00000
	B	-0.00043	-0.00045	-0.00004

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)	-0.00254	-0.00305	-0.00308
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00171	-0.00201	-0.00199

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)	0.00306	0.00307	0.00309
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00198	0.00201	0.00199

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)	-0.00151	-0.00152	-0.00151
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00097	-0.00097	-0.00097

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)	0.00159	0.00160	0.00154
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00102	0.00101	0.00098

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00420	0.00428	0.00349	0.69261

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.07704	0.35472

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)	0.08836	1.00212	10.69400
	A1->Y (FR)	0.11084	1.01049	10.39180
	B0->Y (FR)	0.06671	0.96562	10.63670

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)	0.08034	0.88364	9.37423
	A1->Y (RF)	0.10042	0.88204	9.15351
	B0->Y (RF)	0.06267	0.90637	9.98550

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	0.00712	0.00707	0.00880
	A1	0.00000	0.00000	0.00000
	A1	0.00873	0.00863	0.00941
	B0	0.00582	0.00578	0.00665

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	0.00017	0.00002	0.00065
	A1	0.00000	0.00000	0.00000
	A1	0.00176	0.00145	0.00208
	B0	0.00248	0.00238	0.00282

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)	-0.00151	-0.00152	-0.00152
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00306	-0.00309	-0.00308
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00314	-0.00315	-0.00314

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)	0.00160	0.00160	0.00154
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00307	0.00309	0.00308
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00315	0.00317	0.00315

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)	-0.00246	-0.00298	-0.00302
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00303	-0.00307	-0.00306
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00310	-0.00312	-0.00311

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)	0.00300	0.00306	0.00302
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00304	0.00307	0.00306
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00310	0.00314	0.00311

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)	-0.00237	-0.00238	-0.00243

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)	0.00243	0.00246	0.00244

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00407	0.00430	0.00442	0.00432	0.70976

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.20538	0.67469

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)	0.12075	1.01705	10.42040
	A1->Y (FR)	0.10187	1.01218	10.73690
	B0->Y (FR)	0.07141	0.98094	10.71530
	B1->Y (FR)	0.09161	0.98650	10.40100

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)	0.14062	0.96637	9.63526
	A1->Y (RF)	0.11190	0.92960	9.55144
	B0->Y (RF)	0.09550	0.95131	10.16950
	B1->Y (RF)	0.12522	0.98941	10.27320

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	0.01133	0.01123	0.01198
	A1	0.00968	0.00963	0.01131
	B0	0.00718	0.00722	0.00890
	B1	0.00888	0.00882	0.00960

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00298	0.00267	0.00325
	A1	0.00153	0.00133	0.00188
	B0	0.00151	0.00139	0.00218
	B1	0.00299	0.00272	0.00354

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)	-0.00253	-0.00305	-0.00308
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00253	-0.00304	-0.00308
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00303	-0.00307	-0.00306
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00311	-0.00312	-0.00311

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)	0.00306	0.00311	0.00309
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00306	0.00311	0.00309
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00304	0.00307	0.00306
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00311	0.00314	0.00312

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)	-0.00149	-0.00151	-0.00150
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00149	-0.00151	-0.00150
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00302	-0.00304	-0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00309	-0.00311	-0.00309

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)	0.00159	0.00159	0.00153
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00158	0.00159	0.00153
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00302	0.00304	0.00303
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00310	0.00312	0.00310

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)	-0.00148	-0.00150	-0.00149
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00150	-0.00150	-0.00149
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00333	-0.00336	-0.00335
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00329	-0.00332	-0.00340

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)	0.00157	0.00158	0.00152
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00157	0.00159	0.00152
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00334	0.00336	0.00335
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00340	0.00344	0.00342

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)	-0.00249	-0.00300	-0.00302
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00249	-0.00299	-0.00302
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00341	-0.00344	-0.00342
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00337	-0.00339	-0.00346

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)	0.00301	0.00304	0.00303
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00301	0.00302	0.00303
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00341	0.00344	0.00342
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00348	0.00350	0.00348

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00453	0.00429	1.45915
sky130_osu_sc_15T_ms__or2_2	0.00453	0.00429	2.85717
sky130_osu_sc_15T_ms__or2_4	0.00453	0.00429	5.60515
sky130_osu_sc_15T_ms__or2_8	0.00453	0.00430	10.72835
sky130_osu_sc_15T_ms__or2_l	0.00337	0.00312	0.73447

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.22710	0.34621
sky130_osu_sc_15T_ms__or2_2	0.00000	0.31141	0.67984
sky130_osu_sc_15T_ms__or2_4	0.00000	0.48405	1.35431
sky130_osu_sc_15T_ms__or2_8	0.00000	0.82934	2.70325
sky130_osu_sc_15T_ms__or2_l	0.00000	0.01303	0.01627

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)	0.10703	0.81954	7.93467
	B->Y (RR)	0.09142	0.77156	7.76952
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.11815	0.75096	8.00606
	B->Y (RR)	0.10218	0.70987	7.85235
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.15360	0.75818	8.44307
	B->Y (RR)	0.13729	0.72812	8.29781
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.22101	0.82803	8.92080
	B->Y (RR)	0.20444	0.80546	8.80503
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.13324	1.00722	8.09023
	B->Y (RR)	0.11694	0.96135	7.90342

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)	0.17428	0.86240	7.57280
	B->Y (FF)	0.14960	0.83052	7.44590
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.20735	0.83131	7.75350
	B->Y (FF)	0.18279	0.81658	7.64789
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.29336	0.89937	8.33698
	B->Y (FF)	0.26883	0.89478	8.25742
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.46722	1.08073	8.87722
	B->Y (FF)	0.44278	1.07412	8.86150
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.23061	0.95160	6.37202
	B->Y (FF)	0.19947	0.92121	6.22817

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	0.00541	0.00491	0.01133
	B	0.00000	0.00000	0.00000
	B	0.00388	0.00357	0.01184
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00910	0.00890	0.01534
	B	0.00000	0.00000	0.00000
	B	0.00753	0.00761	0.01573
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01720	0.01764	0.02373
	B	0.00000	0.00000	0.00000
	B	0.01566	0.01648	0.02355
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03389	0.03465	0.04204
	B	0.00000	0.00000	0.00000
	B	0.03228	0.03357	0.04205
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00381	0.00341	0.00655
	B	0.00000	0.00000	0.00000
	B	0.00286	0.00259	0.00630

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	0.01109	0.01103	0.01698
	B	0.00000	0.00000	0.00000
	B	0.00920	0.00967	0.01998
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01339	0.01392	0.01969
	B	0.00000	0.00000	0.00000
	B	0.01151	0.01245	0.02234
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01948	0.02078	0.02635
	B	0.00000	0.00000	0.00000
	B	0.01758	0.01906	0.02860
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.03332	0.03386	0.04010
	B	0.00000	0.00000	0.00000
	B	0.03131	0.03248	0.04204
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00807	0.00782	0.01055
	B	0.00000	0.00000	0.00000
	B	0.00678	0.00685	0.01132

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)	-0.00254	-0.00308	-0.00309
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00253	-0.00308	-0.00309
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00253	-0.00308	-0.00310
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00253	-0.00308	-0.00310
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00172	-0.00203	-0.00201

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)	0.00308	0.00312	0.00310
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00307	0.00312	0.00310
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00308	0.00312	0.00310
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00308	0.00313	0.00310
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00200	0.00203	0.00201

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)	-0.00151	-0.00153	-0.00152
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00153	-0.00152
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00153	-0.00152
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00151	-0.00153	-0.00152
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00100	-0.00099	-0.00099

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)	0.00161	0.00161	0.00155
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00161	0.00155
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00161	0.00155
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00161	0.00162	0.00155
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00103	0.00104	0.00100

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00444	0.00564	0.72247
sky130_osu_sc_15T_ms__tbufi_l	0.00328	0.00420	0.39269

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.17666	0.68168
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.01069	0.02778

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)	0.06078	0.97094	10.75670
	OE->Y (FR)	0.06008	0.36711	4.68850
	OE->Y (RR)	0.11790	0.92917	7.83477
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.09070	1.16896	10.95240
	OE->Y (FR)	0.07823	0.36723	4.68827
	OE->Y (RR)	0.15215	1.14866	7.93220

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)	0.05759	0.87536	9.85390
	OE->Y (FF)	0.06105	0.36711	4.68852
	OE->Y (RF)	0.05386	0.84626	9.35242
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.07469	0.96176	9.29348
	OE->Y (FF)	0.07939	0.36723	4.68832
	OE->Y (RF)	0.06729	0.92308	8.75006

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	0.00496	0.00502	0.00672
	OE	0.00000	0.00000	0.00000
	OE	0.00484	0.00459	0.01468
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00359	0.00329	0.00422
	OE	0.00000	0.00000	0.00000
	OE	0.00338	0.00303	0.00774

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	-0.00080	-0.00077	0.00007
	OE	0.00000	0.00000	0.00000
	OE	0.00316	0.00287	0.01393
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00043	-0.00047	-0.00010
	OE	0.00000	0.00000	0.00000
	OE	0.00213	0.00177	0.00677

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)	-0.00244	-0.00247	-0.00243
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00215	-0.00216	-0.00215
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00171	-0.00173	-0.00171
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00152	-0.00152	-0.00151

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)	0.00244	0.00247	0.00243
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00220	0.00222	0.00218
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00171	0.00173	0.00171
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00155	0.00155	0.00153

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)	0.00190	0.00172	0.01283
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00164	0.00144	0.01252
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00124	0.00092	0.00592
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00109	0.00075	0.00575

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)	0.00586	0.00581	0.01762
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00583	0.00590	0.01770
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00435	0.00414	0.00934
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00442	0.00423	0.00942

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00444	0.00692	0.72195
sky130_osu_sc_15T_ms__tnbufi_l	0.00327	0.00486	0.39111

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.28889	0.34597
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.01455	0.01720

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)	0.06144	0.97072	10.75180
	OE->Y (RR)	0.04385	0.36774	4.68920
	OE->Y (FR)	0.07570	0.96998	10.42290
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.09173	1.16769	10.92540
	OE->Y (RR)	0.04861	0.36765	4.68913
	OE->Y (FR)	0.10449	1.17828	10.63240

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)	0.05662	0.87477	9.84953
	OE->Y (RF)	0.04360	0.36775	4.68920
	OE->Y (FF)	0.08761	0.74008	6.11363
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.07331	0.95987	9.27427
	OE->Y (RF)	0.04850	0.36767	4.68911
	OE->Y (FF)	0.11607	0.87126	5.71738

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	0.00509	0.00514	0.00685
	OE	0.00000	0.00000	0.00000
	OE	0.01220	0.01264	0.02509
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00373	0.00344	0.00436
	OE	0.00000	0.00000	0.00000
	OE	0.00863	0.00864	0.01426

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	-0.00098	-0.00094	-0.00010
	OE	0.00000	0.00000	0.00000
	OE	0.01068	0.01117	0.02274
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00060	-0.00063	-0.00026
	OE	0.00000	0.00000	0.00000
	OE	0.00748	0.00754	0.01293

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)	-0.00209	-0.00212	-0.00209
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00183	-0.00184	-0.00183
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00139	-0.00140	-0.00138
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00120	-0.00121	-0.00120

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)	0.00209	0.00212	0.00209
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00188	0.00189	0.00186
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00139	0.00140	0.00138
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00123	0.00123	0.00122

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)	-0.00356	-0.00416	0.00740
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00362	-0.00417	0.00743
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00223	-0.00280	0.00239
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00223	-0.00276	0.00242

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)	0.00925	0.00971	0.02208
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00907	0.00956	0.02191
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00647	0.00654	0.01209
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00636	0.00642	0.01198

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	**B**	**Y**
sky130_osu_sc_15T_ms__xnor2_l	0.00882	0.00790	0.74168

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.60840	1.02003

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_1	A->Y (RR)	B	0.14814	0.98449	8.09309
	A->Y (FR)	!B	0.08104	1.00086	10.91230
	B->Y (RR)	A	0.12076	0.95719	8.08788
	B->Y (FR)	!A	0.10412	1.00522	10.59740

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (FF)	B	0.15892	0.87484	6.57358
	A->Y (RF)	!B	0.07885	0.87435	9.52060
	B->Y (FF)	A	0.13125	0.84816	6.55319
	B->Y (RF)	!A	0.10143	0.90098	9.54533

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	0.00484	0.00439	0.01419
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01225	0.01235	0.02591
	B	A	0.00000	0.00000	0.00000
	B	A	0.00173	0.00157	0.01252
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01329	0.01347	0.02616

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	0.01490	0.01466	0.02628
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00312	0.00266	0.01409
	B	A	0.00000	0.00000	0.00000
	B	A	0.01329	0.01372	0.02579
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00429	0.00372	0.01512

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

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	0.00884	0.00795	0.73058

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.60840	1.04564

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	0.14540	0.97777	8.09171
	A->Y (FR)	B	0.09823	0.99828	10.59750
	B->Y (RR)	!A	0.12560	0.96505	8.08961
	B->Y (FR)	A	0.10739	1.00945	10.59550

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	0.13754	0.84970	6.45302
	A->Y (RF)	B	0.08834	0.92330	9.95198
	B->Y (FF)	!A	0.12938	0.84517	6.48129
	B->Y (RF)	A	0.09939	0.89781	9.46809

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	0.01417	0.01432	0.02706
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00256	0.00171	0.01230
	B	A	0.00000	0.00000	0.00000
	B	A	0.01455	0.01478	0.02739
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00158	0.00135	0.01224

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	0.00289	0.00231	0.01386
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01501	0.01532	0.02649
	B	A	0.00000	0.00000	0.00000
	B	A	0.00294	0.00232	0.01366
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01351	0.01401	0.02605

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_ss_1P60_100C.ccs
Cell Library: Process , Voltage 1.60, Temp 100.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__ant	5.49450
sky130_osu_sc_15T_ms__tiehi	5.49450
sky130_osu_sc_15T_ms__tielo	5.49450

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_15T_ms__ant	0.43656
sky130_osu_sc_15T_ms__tiehi	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__ant	0.00000	155766.00000	311531.00000
sky130_osu_sc_15T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	-0.00187	0.04397	0.56604

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__ant	0.00000	0.00000	0.00000
	2.71114	2.55810	0.68733