sky130_osu_sc_15T_ms_tt_1P89_25C.ccs Library

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

SKY130_OSU_SC_15T_MS__ADDFx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01567	0.01565	0.01207	2.25046	1.04217	2.11880
sky130_osu_sc_15T_ms__addf_l	0.01566	0.01564	0.01208	1.35889	1.04655	1.38492

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addf_1	0.00000	0.50375	0.66125
sky130_osu_sc_15T_ms__addf_l	0.00000	0.31795	0.47544

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)	0.12822	1.59083	25.51310
	B->CO (RR)	0.11144	1.52757	24.62810
	CI->CO (RR)	0.12115	1.62166	26.09280
	CON->CO (FR)	0.02212	0.66911	10.79590
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.13301	1.46672	19.55600
	B->CO (RR)	0.12909	1.43357	19.19010
	CI->CO (RR)	0.12597	1.49885	20.17800
	CON->CO (FR)	0.02792	0.76119	10.87760

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)	0.16869	1.96003	31.27330
	B->CO (FF)	0.15043	1.87369	30.07370
	CI->CO (FF)	0.14805	1.95847	31.62070
	CON->CO (RF)	0.02110	0.59415	9.60626
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.16360	1.64837	21.76150
	B->CO (FF)	0.14577	1.58359	21.18090
	CI->CO (FF)	0.14291	1.64834	22.15230
	CON->CO (RF)	0.02270	0.58646	8.40393

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)	0.12661	0.84908	9.99883
	B->CON (FR)	0.10951	0.81280	9.88783
	CI->CON (FR)	0.10600	0.85068	10.42210
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.11972	0.84347	10.01960
	B->CON (FR)	0.10311	0.80801	9.90713
	CI->CON (FR)	0.09905	0.84535	10.44310

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)	0.08562	0.60704	7.23637
	B->CON (RF)	0.08297	0.61376	7.45804
	CI->CON (RF)	0.07854	0.63928	7.90244
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.08185	0.60414	7.25196
	B->CON (RF)	0.07945	0.61114	7.47204
	CI->CON (RF)	0.07474	0.63790	7.91741

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)	0.24567	1.73301	24.00660
	B->S (-R)	0.25501	1.71911	23.12790
	CI->S (-R)	0.22337	1.72864	24.35980
	CON->S (RR)	0.07026	0.57167	7.04896
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.23653	1.59263	19.22360
	B->S (-R)	0.24600	1.59075	18.72450
	CI->S (-R)	0.21408	1.58954	19.61330
	CON->S (RR)	0.07199	0.63424	7.04118

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)	0.21084	1.43607	19.01390
	B->S (-F)	0.21045	1.39019	18.43400
	CI->S (-F)	0.20321	1.46416	19.59820
	CON->S (FF)	0.08521	0.61282	6.97378
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.19770	1.27774	14.74810
	B->S (-F)	0.19315	1.23735	14.55830
	CI->S (-F)	0.18994	1.30687	15.36700
	CON->S (FF)	0.08095	0.60986	6.28600

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	0.00357	0.00480	0.03198
	B	0.00415	0.00525	0.02990
	CI	0.00555	0.00691	0.03446
sky130_osu_sc_15T_ms__addf_l	A	0.00259	0.00330	0.01937
	B	0.00319	0.00384	0.01827
	CI	0.00457	0.00544	0.02141

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01420	0.01589	0.05770
	B	0.01494	0.01627	0.05324
	CI	0.01198	0.01385	0.05665
sky130_osu_sc_15T_ms__addf_l	A	0.01327	0.01436	0.03890
	B	0.01400	0.01484	0.03632
	CI	0.01104	0.01233	0.03836

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01418	0.01509	0.03494
	B	0.01462	0.01534	0.03369
	CI	0.01196	0.01309	0.03449
sky130_osu_sc_15T_ms__addf_l	A	0.01326	0.01407	0.03342
	B	0.01371	0.01438	0.03228
	CI	0.01103	0.01212	0.03305

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00353	0.00431	0.01812
	B	0.00412	0.00476	0.01755
	CI	0.00553	0.00638	0.02081
sky130_osu_sc_15T_ms__addf_l	A	0.00256	0.00319	0.01593
	B	0.00317	0.00366	0.01542
	CI	0.00456	0.00528	0.01849

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01420	0.01581	0.05481
	B	0.01493	0.01620	0.05069
	CI	0.01197	0.01376	0.05376
sky130_osu_sc_15T_ms__addf_l	A	0.01327	0.01437	0.03929
	B	0.00114	-0.00095	0.03489
	CI	0.00347	0.00341	0.03613

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.03150	0.03197	0.06370
	B	0.02816	0.02923	0.07101
	CI	0.02572	0.02599	0.05621
sky130_osu_sc_15T_ms__addf_l	A	0.03020	0.03042	0.06301
	B	0.02691	0.02807	0.07120
	CI	0.02448	0.02478	0.05618

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00767	0.00850	2.17676	1.12469	2.24666
sky130_osu_sc_15T_ms__addh_l	0.00767	0.00850	1.41184	1.12093	1.43801

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__addh_1	0.00000	0.57447	0.66099
sky130_osu_sc_15T_ms__addh_l	0.00000	0.34214	0.47517

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)	0.08528	0.58856	6.98357
	B->CO (RR)	0.08855	0.58217	7.04770
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.08855	0.65439	7.02131
	B->CO (RR)	0.09183	0.64898	7.05272

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)	0.07239	0.57759	6.89447
	B->CO (FF)	0.07769	0.59202	6.93570
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.06887	0.53223	5.45944
	B->CO (FF)	0.07387	0.54656	5.49972

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	0.11795	0.48405	3.73584
	A->CON (FR)	!B	0.06806	0.78942	10.26820
	B->CON (RR)	A	0.12091	0.47668	3.80372
	B->CON (FR)	!A	0.08412	0.79104	9.99034
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.10861	0.46787	3.72770
	A->CON (FR)	!B	0.06184	0.78231	10.23980
	B->CON (RR)	A	0.11161	0.46169	3.75866
	B->CON (FR)	!A	0.07788	0.78338	9.96158

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	0.11478	0.61593	5.68134
	A->CON (RF)	!B	0.05005	0.61333	8.06813
	B->CON (FF)	A	0.11249	0.64520	6.01718
	B->CON (RF)	!A	0.06069	0.60595	7.77168
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.10656	0.59756	5.59681
	A->CON (RF)	!B	0.04657	0.60884	8.04785
	B->CON (FF)	A	0.10427	0.62680	5.93054
	B->CON (RF)	!A	0.05727	0.60178	7.75270

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	0.08839	1.55405	25.57240
	A->S (FR)	B	0.15389	1.54286	22.97620
	B->S (RR)	!A	0.09945	1.51405	24.61110
	B->S (FR)	A	0.15171	1.60435	23.98450
	CON->S (FR)	-	0.02428	0.68529	11.03120
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.08988	1.44425	20.39030
	A->S (FR)	B	0.15088	1.42115	17.76120
	B->S (RR)	!A	0.10118	1.41382	19.71740
	B->S (FR)	A	0.14852	1.47480	18.47870
	CON->S (FR)	-	0.02830	0.76720	11.11520

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	0.10393	1.78352	29.36790
	A->S (RF)	B	0.14928	1.22060	17.38230
	B->S (FF)	!A	0.12004	1.78968	29.16700
	B->S (RF)	A	0.15223	1.21309	17.44980
	CON->S (RF)	-	0.01991	0.58127	9.39598
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.09890	1.54612	21.77890
	A->S (RF)	B	0.14081	1.07492	12.68940
	B->S (FF)	!A	0.11491	1.55067	21.53190
	B->S (RF)	A	0.14381	1.06815	12.71750
	CON->S (RF)	-	0.02144	0.58876	8.56843

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	0.00664	0.00682	0.02016
	B	0.00000	0.00000	0.00000
	B	0.00597	0.00597	0.02297
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00573	0.00589	0.02156
	B	0.00000	0.00000	0.00000
	B	0.00506	0.00502	0.02286

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	0.01013	0.01065	0.03276
	B	0.00000	0.00000	0.00000
	B	0.01052	0.01168	0.03512
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00925	0.00967	0.02956
	B	0.00000	0.00000	0.00000
	B	0.00965	0.01057	0.03105

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	0.00663	0.00681	0.02066
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00900	0.00954	0.01766
	B	A	0.00000	0.00000	0.00000
	B	A	0.00596	0.00596	0.02345
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01010	0.01026	0.01604
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00572	0.00588	0.02138
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00838	0.00888	0.01596
	B	A	0.00000	0.00000	0.00000
	B	A	0.00506	0.00502	0.02265
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00947	0.00952	0.01430

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	0.01012	0.01060	0.03092
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00131	0.00171	0.00759
	B	A	0.00000	0.00000	0.00000
	B	A	0.01053	0.01158	0.03308
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00237	0.00255	0.00821
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00925	0.00967	0.02932
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00048	0.00073	0.00477
	B	A	0.00000	0.00000	0.00000
	B	A	0.00966	0.01056	0.03089
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00154	0.00158	0.00557

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	0.01014	0.01067	0.03302
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00133	0.00186	0.00983
	B	A	0.00000	0.00000	0.00000
	B	A	0.01053	0.01171	0.03542
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00241	0.00269	0.00989
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00926	0.00966	0.02973
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00049	0.00075	0.00482
	B	A	0.00000	0.00000	0.00000
	B	A	0.00966	0.01059	0.03135
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00156	0.00162	0.00542

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	0.00664	0.00684	0.02051
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00902	0.00966	0.01836
	B	A	0.00000	0.00000	0.00000
	B	A	0.00597	0.00598	0.02317
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01012	0.01046	0.01771
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00573	0.00586	0.02182
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00839	0.00887	0.01561
	B	A	0.00000	0.00000	0.00000
	B	A	0.00506	0.00502	0.02304
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00949	0.00959	0.01432

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__and2_1	10.37850
sky130_osu_sc_15T_ms__and2_2	12.82050
sky130_osu_sc_15T_ms__and2_4	17.70450
sky130_osu_sc_15T_ms__and2_6	22.58850
sky130_osu_sc_15T_ms__and2_8	27.47250
sky130_osu_sc_15T_ms__and2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00413	0.00424	2.19273
sky130_osu_sc_15T_ms__and2_2	0.00413	0.00424	4.24961
sky130_osu_sc_15T_ms__and2_4	0.00413	0.00424	8.10238
sky130_osu_sc_15T_ms__and2_6	0.00417	0.00424	11.93780
sky130_osu_sc_15T_ms__and2_8	0.00414	0.00425	15.46869
sky130_osu_sc_15T_ms__and2_l	0.00312	0.00323	1.34015

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.27537	0.44051
sky130_osu_sc_15T_ms__and2_2	0.00000	0.44053	0.44080
sky130_osu_sc_15T_ms__and2_4	0.00000	0.77084	0.88074
sky130_osu_sc_15T_ms__and2_6	0.00000	1.10115	1.32097
sky130_osu_sc_15T_ms__and2_8	0.00000	1.43147	1.76120
sky130_osu_sc_15T_ms__and2_l	0.00000	0.04305	0.06877

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)	0.06493	0.53125	6.93571
	B->Y (RR)	0.06945	0.52971	6.75606
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.07490	0.48517	6.93929
	B->Y (RR)	0.07946	0.47861	6.76519
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.10342	0.50073	7.11124
	B->Y (RR)	0.10793	0.48733	6.95615
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.13178	0.53711	7.29927
	B->Y (RR)	0.13620	0.51750	7.14830
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.15984	0.57592	7.45077
	B->Y (RR)	0.16433	0.55289	7.30164
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.07348	0.60987	6.72198
	B->Y (RR)	0.07811	0.60721	6.55048

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)	0.05648	0.51643	6.50705
	B->Y (FF)	0.05965	0.52950	6.54256
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.06403	0.47886	6.47453
	B->Y (FF)	0.06761	0.49073	6.52755
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.08812	0.49668	6.57231
	B->Y (FF)	0.09132	0.50409	6.63651
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.11463	0.53252	6.72648
	B->Y (FF)	0.11729	0.53751	6.78413
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.13940	0.56536	6.75254
	B->Y (FF)	0.14178	0.56941	6.80907
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.06398	0.55651	5.89590
	B->Y (FF)	0.06856	0.57217	5.96874

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	0.00471	0.00608	0.06491
	B	0.00000	0.00000	0.00000
	B	0.00480	0.00522	0.04371
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00953	0.01091	0.06854
	B	0.00000	0.00000	0.00000
	B	0.00963	0.01032	0.04718
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02048	0.02184	0.07645
	B	0.00000	0.00000	0.00000
	B	0.02057	0.02171	0.05616
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03279	0.03371	0.08699
	B	0.00000	0.00000	0.00000
	B	0.03289	0.03284	0.06746
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04562	0.04518	0.09559
	B	0.00000	0.00000	0.00000
	B	0.04572	0.04471	0.07876
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00340	0.00428	0.04269
	B	0.00000	0.00000	0.00000
	B	0.00349	0.00372	0.02899

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	0.01230	0.01519	0.06855
	B	0.00000	0.00000	0.00000
	B	0.01392	0.01644	0.06682
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01569	0.01890	0.07181
	B	0.00000	0.00000	0.00000
	B	0.01732	0.02004	0.07047
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02463	0.02811	0.08010
	B	0.00000	0.00000	0.00000
	B	0.02620	0.02923	0.07888
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.03428	0.03760	0.08933
	B	0.00000	0.00000	0.00000
	B	0.03563	0.03886	0.08769
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.04521	0.04717	0.09822
	B	0.00000	0.00000	0.00000
	B	0.04657	0.04811	0.09618
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00935	0.01107	0.04460
	B	0.00000	0.00000	0.00000
	B	0.01048	0.01189	0.04353

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)	-0.00459	-0.00461	-0.00462
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00459	-0.00460	-0.00462
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00458	-0.00459	-0.00461
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00461	-0.00462	-0.00464
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00458	-0.00459	-0.00461
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00323	-0.00324	-0.00325

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)	0.00461	0.00472	0.00464
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00461	0.00472	0.00464
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00462	0.00472	0.00464
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00465	0.00475	0.00468
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00462	0.00472	0.00465
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00324	0.00331	0.00326

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)	-0.00435	-0.00436	-0.00436
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00435	-0.00438	-0.00436
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00434	-0.00438	-0.00435
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00433	-0.00437	-0.00435
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00433	-0.00436	-0.00435
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00307	-0.00309	-0.00308

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)	0.00440	0.00444	0.00437
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00441	0.00444	0.00438
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00441	0.00444	0.00438
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00441	0.00444	0.00438
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00442	0.00445	0.00439
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00312	0.00313	0.00309

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	x	0	1
x	x	1	0
1	0	0	1
1	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00391	0.00407	0.00393	1.00075

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__aoi21_l	0.00000	0.10559	0.22012

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)	0.06797	0.79482	9.89934
	A1->Y (FR)	0.05644	0.75128	9.51532
	B0->Y (FR)	0.04942	0.79569	10.33010

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)	0.04603	0.54096	6.75698
	A1->Y (RF)	0.04185	0.56469	7.24678
	B0->Y (RF)	0.02729	0.53482	7.05104

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	0.01101	0.01097	0.01783
	A1	0.00000	0.00000	0.00000
	A1	0.00922	0.00918	0.01601
	B0	0.00661	0.00711	0.02017

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	0.00228	0.00200	0.00676
	A1	0.00000	0.00000	0.00000
	A1	0.00233	0.00228	0.00812
	B0	-0.00117	-0.00079	0.00538

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)	-0.00333	-0.00398	-0.00400
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00404	-0.00406	-0.00404
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00405	-0.00407	-0.00405

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)	0.00397	0.00398	0.00400
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00404	0.00408	0.00406
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00408	0.00410	0.00406

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)	-0.00332	-0.00393	-0.00394
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00398	-0.00400	-0.00398
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00431	-0.00434	-0.00434

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)	0.00391	0.00393	0.00394
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00398	0.00403	0.00399
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00433	0.00436	0.00435

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)	-0.00186	-0.00191	-0.00187

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)	0.00202	0.00204	0.00191

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	**A1**	**B0**	**B1**	**Y**
0	**x**	**0**	**x**	**1**
0	**x**	**1**	**0**	**1**
x	**x**	**1**	**1**	**0**
1	**0**	**0**	**x**	**1**
1	**0**	**1**	**0**	**1**
1	**1**	**x**	**x**	**0**

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_l	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	**A1**	**B0**	**B1**	**Y**
sky130_osu_sc_15T_ms__aoi22_l	0.00390	0.00405	0.00419	0.00399	1.01770

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.11735	0.44022

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)	0.08307	0.80428	9.86080
	A1->Y (FR)	0.07376	0.78650	9.75623
	B0->Y (FR)	0.05008	0.78414	10.15540
	B1->Y (FR)	0.05958	0.80039	10.32080

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)	0.06097	0.56011	6.84594
	A1->Y (RF)	0.05671	0.58381	7.33679
	B0->Y (RF)	0.03058	0.55530	7.31046
	B1->Y (RF)	0.03426	0.52808	6.82011

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	0.01343	0.01337	0.02037
	A1	0.01165	0.01155	0.01855
	B0	0.00720	0.00787	0.02129
	B1	0.00898	0.00979	0.02317

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00477	0.00449	0.00936
	A1	0.00482	0.00474	0.01077
	B0	-0.00086	-0.00052	0.00552
	B1	-0.00075	-0.00075	0.00419

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)	-0.00336	-0.00399	-0.00400
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00404	-0.00404	-0.00404
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00404	-0.00406	-0.00405
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00404	-0.00406	-0.00405

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)	0.00398	0.00403	0.00400
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00405	0.00404	0.00406
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00409	0.00410	0.00406
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00409	0.00410	0.00406

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)	-0.00332	-0.00394	-0.00394
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00397	-0.00400	-0.00397
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00430	-0.00433	-0.00433
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00430	-0.00433	-0.00433

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)	0.00391	0.00395	0.00394
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00398	0.00403	0.00399
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00432	0.00434	0.00435
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00432	0.00434	0.00435

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)	-0.00187	-0.00192	-0.00188
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00187	-0.00189	-0.00188
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00446	-0.00449	-0.00449
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00445	-0.00445	-0.00449

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)	0.00210	0.00212	0.00193
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00187	0.00189	0.00188
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00448	0.00451	0.00450
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00447	0.00451	0.00450

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)	-0.00189	-0.00193	-0.00190
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00188	-0.00190	-0.00189
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00412	-0.00414	-0.00412
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00412	-0.00414	-0.00412

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)	0.00212	0.00213	0.00195
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00189	0.00191	0.00189
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00416	0.00417	0.00413
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00416	0.00417	0.00413

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00423	2.16743
sky130_osu_sc_15T_ms__buf_2	0.00427	4.22368
sky130_osu_sc_15T_ms__buf_4	0.00426	8.17356
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00428	15.76313
sky130_osu_sc_15T_ms__buf_l	0.00325	1.35026

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__buf_1	0.00000	0.22040	0.22040
sky130_osu_sc_15T_ms__buf_2	0.00000	0.33060	0.44051
sky130_osu_sc_15T_ms__buf_4	0.00000	0.55100	0.88074
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_15T_ms__buf_8	0.00000	0.99179	1.76119
sky130_osu_sc_15T_ms__buf_l	0.00000	0.03459	0.03459

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)**	0.05017	0.50269	6.67759
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.05756	0.44872	6.64292
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.07803	0.45221	6.86214
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.11779	0.50770	7.19410
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.05733	0.57641	6.46851

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)**	0.05340	0.50763	6.48056
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.06245	0.48723	6.74535
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.08676	0.50582	7.02230
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.13806	0.57554	7.29882
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.06135	0.55167	5.95460

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	0.00443	0.00572	0.04831
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00914	0.01043	0.05142
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01979	0.02138	0.06148
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04282	0.04447	0.08238
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00331	0.00421	0.03413

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	0.01180	0.01507	0.06810
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01526	0.01820	0.06701
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02407	0.02752	0.07622
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.04458	0.04585	0.09439
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00903	0.01071	0.04451

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
	-0.00081	-0.00081	-0.00079

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
	0.00081	0.00081	0.00079

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00402	0.00399	0.01176	1.98690	1.97659
sky130_osu_sc_15T_ms__dffr_l	0.00402	0.00399	0.01174	1.34693	1.34626

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffr_1	0.00000	0.62724	1.07454
sky130_osu_sc_15T_ms__dffr_l	0.00000	0.44143	0.88874

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)	0.26448	1.25954	15.26310
	QN->Q (FR)	0.02818	0.78718	12.36900
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.25803	1.35759	14.72620
	QN->Q (FR)	0.03124	0.84169	12.01140

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)	0.25590	1.28258	15.98520
	QN->Q (RF)	0.02375	0.64621	10.11140
	RN->Q (FF)	0.18849	1.28358	16.83780
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.26050	1.40401	15.49030
	QN->Q (RF)	0.02430	0.64185	9.18530
	RN->Q (FF)	0.19327	1.40548	16.34290

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)	0.22575	0.70710	6.67692
	RN->QN (FR)	0.15807	0.70877	7.53248
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.22751	0.77734	6.79281
	RN->QN (FR)	0.16011	0.77895	7.64278

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)**	0.22758	0.65358	5.48551
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.21554	0.65587	5.01114

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)	-0.06386	-0.07681	0.00421
	setup	CK (R)	0.21050	0.24293	0.81868
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06578	-0.07681	0.00350
	setup	CK (R)	0.21045	0.24462	0.83081

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)	-0.09624	-0.27972	-1.76330
	setup	CK (R)	0.12107	0.28954	2.89441
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.09870	-0.28138	-1.81643
	setup	CK (R)	0.12091	0.28954	2.89441

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)	-0.06386	-0.07681	0.00421
	setup	CK (R)	0.21050	0.24293	0.81868
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06578	-0.07681	0.00350
	setup	CK (R)	0.21045	0.24462	0.83081

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)	-0.09624	-0.27972	-1.76330
	setup	CK (R)	0.12107	0.28954	2.89441
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.09870	-0.28138	-1.81643
	setup	CK (R)	0.12091	0.28954	2.89441

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)	0.17950	0.20949	1.08920
	removal	CK (R)	-0.04195	-0.05162	-0.13134
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.17979	0.21112	1.08731
	removal	CK (R)	-0.04195	-0.05162	-0.13134

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)	0.17950	0.20949	1.08920
	removal	CK (R)	-0.04195	-0.05162	-0.13134
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.17979	0.21112	1.08731
	removal	CK (R)	-0.04195	-0.05162	-0.13134

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 ()	0.10735	0.46143	13.33370
	min_pulse_width	RN ()	0.10735	0.46143	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.10735	0.46143	13.33370
	min_pulse_width	RN ()	0.10735	0.46143	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 ()	0.12470	0.46143	13.33370
	min_pulse_width	CK ()	0.13165	0.46143	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.11776	0.46143	13.33370
	min_pulse_width	CK ()	0.12817	0.46143	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 ()	0.26356	0.46143	13.33370
	min_pulse_width	CK ()	0.10040	0.46143	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.26356	0.46143	13.33370
	min_pulse_width	CK ()	0.10040	0.46143	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	0.01204	0.01024	0.00856
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01055	0.00984	0.03140

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	0.01364	0.01070	-0.00856
	RN	-0.00154	-0.10574	-1.77434
	RN	0.03165	0.02951	0.00953
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01218	0.01074	0.01909
	RN	-0.00154	-0.08374	-1.20284
	RN	0.03017	0.02954	0.03889

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	0.01363	0.01070	-0.00819
	RN	-0.00154	-0.10541	-1.76507
	RN	0.03164	0.02954	0.00969
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01218	0.01077	0.01886
	RN	-0.00154	-0.08372	-1.20224
	RN	0.03016	0.02954	0.03873

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	0.01198	0.01027	0.00819
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01049	0.00977	0.03095

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	-0.00327	-0.00391	-0.00397
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01492	0.01479	0.05120
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00627	0.00625	0.04275
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00327	-0.00392	-0.00397
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01492	0.01479	0.05120
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00627	0.00625	0.04275

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	0.00396	0.00400	0.00399
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02422	0.02455	0.06276
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01169	0.01209	0.04946
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00396	0.00400	0.00399
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02422	0.02458	0.06276
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01169	0.01208	0.04945

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)	0.00429	0.00535	0.06842
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01320	0.01395	0.07812
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)	0.00429	0.00535	0.06842
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01320	0.01395	0.07812

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)	0.01152	0.01438	0.07818
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02395	0.02658	0.09093
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)	0.01152	0.01437	0.07817
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02395	0.02660	0.09092

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)	-0.00108	-0.00025	0.06264
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00723	0.00724	0.07248
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00149	-0.00038	0.06187
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00108	-0.00025	0.06264
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00723	0.00724	0.07248
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00150	-0.00038	0.06186

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)	0.01750	0.02008	0.08431
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03766	0.03912	0.11578
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02850	0.03034	0.09568
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03671	0.04114	0.14675
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01976	0.02212	0.08554
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01750	0.02008	0.08431
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03766	0.03900	0.11578
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02850	0.03033	0.09568
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03671	0.04114	0.14676
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01976	0.02212	0.08554

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffsr_1	0.00397	0.00400	0.00882	0.01200	2.26104	2.23677
sky130_osu_sc_15T_ms__dffsr_l	0.00397	0.00400	0.00880	0.01200	1.34434	1.34633

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffsr_1	0.00000	0.77282	1.07430
sky130_osu_sc_15T_ms__dffsr_l	0.00000	0.58702	0.88849

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)	0.25893	1.28930	16.63980
	QN->Q (FR)	0.02452	0.73086	11.85050
	RN->Q (RR)	0.20973	1.25361	16.69530
	SN->Q (FR)	0.18791	1.30384	17.72530
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.26050	1.36073	14.68700
	QN->Q (FR)	0.03124	0.83873	11.97290
	RN->Q (RR)	0.21228	1.32677	14.74840
	SN->Q (FR)	0.18972	1.37181	15.75320

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)	0.29468	1.35019	17.27080
	QN->Q (RF)	0.02346	0.67725	10.98100
	RN->Q (FF)	0.19508	1.32451	18.11980
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.30441	1.45165	15.51250
	QN->Q (RF)	0.02425	0.64087	9.16604
	RN->Q (FF)	0.20461	1.42418	16.35920

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)	0.26443	0.74362	6.89891
	RN->QN (FR)	0.16533	0.71769	7.74930
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.27080	0.82605	6.84494
	RN->QN (FR)	0.17132	0.79911	7.69046

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)	0.22560	0.67703	6.18678
	RN->QN (RF)	0.17732	0.64262	6.24477
	SN->QN (FF)	0.15498	0.69147	7.26211
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.21949	0.66154	5.01031
	RN->QN (RF)	0.17170	0.62799	5.06473
	SN->QN (FF)	0.14926	0.67266	6.07383

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)	-0.06184	-0.08116	-0.03526
	setup	CK (R)	0.20030	0.23166	0.87692
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06561	-0.07808	-0.03617
	setup	CK (R)	0.19972	0.23148	0.87911

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)	-0.11496	-0.30138	-1.78872
	setup	CK (R)	0.14388	0.31027	2.96730
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.11532	-0.30096	-1.77535
	setup	CK (R)	0.14345	0.31027	2.96730

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)	-0.06184	-0.08116	-0.03526
	setup	CK (R)	0.20030	0.23166	0.87692
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06561	-0.07808	-0.03617
	setup	CK (R)	0.19972	0.23148	0.87911

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)	-0.11496	-0.30138	-1.78872
	setup	CK (R)	0.14388	0.31027	2.96730
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.11532	-0.30096	-1.77535
	setup	CK (R)	0.14345	0.31027	2.96730

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)	0.15158	0.18412	1.03561
	removal	CK (R)	-0.02190	-0.02797	-0.07095
	hold	SN (R)	-0.14856	-0.29132	-1.21082
	setup	SN (R)	0.17452	0.33783	4.97431
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.15151	0.18357	1.03976
	removal	CK (R)	-0.02190	-0.02797	-0.07095
	hold	SN (R)	-0.14658	-0.28321	-1.16642
	setup	SN (R)	0.17332	0.32921	4.91235

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)	0.15158	0.18412	1.03561
	removal	CK (R)	-0.02190	-0.02797	-0.07095
	hold	SN (R)	-0.14856	-0.29132	-1.21082
	hold	SN (R)	-0.15021	-0.29323	-1.21392
	setup	SN (R)	0.17452	0.33783	4.82315
	setup	SN (R)	0.17386	0.33561	4.97431
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.15151	0.18357	1.03976
	removal	CK (R)	-0.02190	-0.02797	-0.07095
	hold	SN (R)	-0.14746	-0.28321	-1.16642
	hold	SN (R)	-0.14658	-0.28502	-1.16880
	setup	SN (R)	0.17332	0.32469	4.67770
	setup	SN (R)	0.16615	0.32921	4.91235

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 ()	0.12817	0.46143	13.33370
	min_pulse_width	RN ()	0.12817	0.46143	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.12817	0.46143	13.33370
	min_pulse_width	RN ()	0.12470	0.46143	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)	0.04106	0.07531	4.92517
	removal	CK (R)	-0.01927	-0.05791	-0.30333
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04002	0.07536	4.77143
	removal	CK (R)	-0.01927	-0.05791	-0.30226

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)	0.04106	0.07531	4.92517
	removal	CK (R)	-0.01927	-0.05791	-0.30333
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.04002	0.07536	4.77143
	removal	CK (R)	-0.01927	-0.05791	-0.30226

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 ()	0.14900	0.46143	13.33370
	min_pulse_width	SN ()	0.14900	0.46143	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.14900	0.46143	13.33370
	min_pulse_width	SN ()	0.14206	0.46143	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 ()	0.11776	0.46143	13.33370
	min_pulse_width	CK ()	0.15247	0.46143	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.11082	0.46143	13.33370
	min_pulse_width	CK ()	0.14900	0.46143	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 ()	0.25314	0.46143	13.33370
	min_pulse_width	CK ()	0.12470	0.46143	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.25314	0.46143	13.33370
	min_pulse_width	CK ()	0.12470	0.46143	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	0.01515	0.01295	0.00245
	RN	0.02769	0.02506	0.00273
	SN	-0.00154	-0.11427	-2.01916
	SN	0.03090	0.02756	0.00009
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01382	0.01304	0.03435
	RN	0.02635	0.02511	0.03460
	SN	-0.00154	-0.08364	-1.20053
	SN	0.02957	0.02759	0.03154

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	0.01594	0.01437	0.01060
	RN	-0.00154	-0.11427	-2.01915
	RN	0.03309	0.03213	0.03062
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01455	0.01324	0.02160
	RN	-0.00154	-0.08364	-1.20053
	RN	0.03165	0.03096	0.04132

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	0.01592	0.01436	0.01098
	RN	-0.00154	-0.11353	-1.99716
	RN	0.03305	0.03210	0.03059
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01455	0.01323	0.02159
	RN	-0.00154	-0.08372	-1.20230
	RN	0.03164	0.03096	0.04111

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	0.01509	0.01296	0.00259
	RN	0.02763	0.02499	0.00302
	SN	-0.00154	-0.11353	-1.99735
	SN	0.03085	0.02752	0.00099
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01376	0.01300	0.03387
	RN	0.02629	0.02497	0.03413
	SN	-0.00154	-0.08372	-1.20224
	SN	0.02951	0.02755	0.03178

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	-0.00390	-0.00395	-0.00397
	(!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)	0.01931	0.01917	0.05537
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00718	0.00716	0.04327
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00718	0.00719	0.04336
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00724	0.00722	0.04333
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00390	-0.00396	-0.00397
	(!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)	0.01931	0.01917	0.05537
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00718	0.00716	0.04327
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00718	0.00719	0.04336
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00724	0.00722	0.04333

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	0.00400	0.00398	0.00397
	(!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)	0.02795	0.02814	0.06549
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01243	0.01287	0.04997
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01259	0.01293	0.04996
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01236	0.01281	0.04990
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00400	0.00398	0.00397
	(!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)	0.02794	0.02813	0.06548
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01241	0.01285	0.04995
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01257	0.01292	0.04995
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01235	0.01279	0.04989

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)	0.00371	0.00467	0.06746
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01614	0.01676	0.08125
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)	0.00371	0.00468	0.06747
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01614	0.01676	0.08125

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)	0.01238	0.01535	0.07928
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02534	0.02793	0.09280
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)	0.01236	0.01534	0.07927
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02532	0.02792	0.09279

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)	-0.00910	-0.00915	-0.00916
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00853	-0.00964	-0.00966
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00860	-0.00921	-0.00918
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00595	0.00606	0.04429
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)	-0.00910	-0.00916	-0.00916
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00851	-0.00961	-0.00964
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00860	-0.00920	-0.00918
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00596	0.00606	0.04430

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)	0.00915	0.00935	0.00920
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00963	0.00964	0.00969
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00917	0.00925	0.00922
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01997	0.01990	0.05686
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)	0.00915	0.00935	0.00919
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00960	0.00961	0.00967
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00916	0.00924	0.00921
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01996	0.01986	0.05685

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)	-0.00108	-0.00025	0.06265
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00835	0.00844	0.07351
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00813	0.00827	0.07337
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00126	-0.00015	0.06211
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00480	0.00702	0.12136
sky130_osu_sc_15T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00108	-0.00026	0.06265
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00833	0.00843	0.07349
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00812	0.00826	0.07336
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00126	-0.00015	0.06211
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00479	0.00702	0.12136

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)	0.04232	0.04378	0.12031
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01757	0.02013	0.08438
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02915	0.03104	0.09617
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02922	0.03122	0.09635
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04038	0.04436	0.15051
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01960	0.02195	0.08540
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02353	0.02801	0.14483
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.04232	0.04382	0.12031
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01757	0.02013	0.08438
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02915	0.03104	0.09617
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02922	0.03122	0.09635
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.04036	0.04435	0.15049
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01960	0.02195	0.08539
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02352	0.02799	0.14482

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00400	0.00696	0.01177	1.98861	1.99327
sky130_osu_sc_15T_ms__dffs_l	0.00400	0.00696	0.01177	1.35456	1.35315

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dffs_1	0.00000	0.55331	0.85358
sky130_osu_sc_15T_ms__dffs_l	0.00000	0.36750	0.66777

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)	0.20799	1.19025	15.14590
	QN->Q (FR)	0.02814	0.78337	12.30570
	SN->Q (FR)	0.16219	1.27580	16.42520
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.20664	1.29881	14.70390
	QN->Q (FR)	0.03118	0.83925	12.00490
	SN->Q (FR)	0.16093	1.37799	15.94760

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)	0.28290	1.31293	15.98720
	QN->Q (RF)	0.02362	0.64329	10.07720
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.28649	1.43616	15.57370
	QN->Q (RF)	0.02420	0.64038	9.18798

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)	0.25181	0.74001	6.73762
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.25268	0.80766	6.83714

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)	0.17419	0.58795	5.43393
	SN->QN (FF)	0.12799	0.67389	6.70796
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.16743	0.59693	4.94942
	SN->QN (FF)	0.12121	0.67660	6.19593

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)	-0.04860	-0.06587	0.01437
	setup	CK (R)	0.15724	0.19377	0.87938
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05028	-0.06353	0.01305
	setup	CK (R)	0.15443	0.19309	0.91273

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)	-0.10121	-0.28297	-1.16880
	setup	CK (R)	0.13095	0.29283	2.91259
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.09883	-0.28297	-1.09199
	setup	CK (R)	0.13296	0.29278	2.91261

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)	-0.04860	-0.06587	0.01437
	setup	CK (R)	0.15724	0.19377	0.87938
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05028	-0.06353	0.01305
	setup	CK (R)	0.15443	0.19309	0.91273

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)	-0.10121	-0.28297	-1.16880
	setup	CK (R)	0.13095	0.29283	2.91259
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.09883	-0.28297	-1.09199
	setup	CK (R)	0.13296	0.29278	2.91261

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)	0.03763	0.06577	3.52285
	removal	CK (R)	-0.01683	-0.05019	-0.13832
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03712	0.06577	3.36243
	removal	CK (R)	-0.01683	-0.05019	-0.13832

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)	0.03763	0.06577	3.52285
	removal	CK (R)	-0.01683	-0.05019	-0.13832
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.03712	0.06577	3.36243
	removal	CK (R)	-0.01683	-0.05019	-0.13832

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 ()	0.11429	0.46143	13.33370
	min_pulse_width	SN ()	0.11776	0.46143	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.11429	0.46143	13.33370
	min_pulse_width	SN ()	0.11082	0.46143	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 ()	0.09346	0.46143	13.33370
	min_pulse_width	CK ()	0.14206	0.46143	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.08652	0.46143	13.33370
	min_pulse_width	CK ()	0.13859	0.46143	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 ()	0.20802	0.46143	13.33370
	min_pulse_width	CK ()	0.11429	0.46143	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.20802	0.46143	13.33370
	min_pulse_width	CK ()	0.11429	0.46143	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	0.01200	0.01025	0.01009
	SN	-0.00154	-0.10579	-1.77588
	SN	0.02594	0.02371	0.00843
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01052	0.00981	0.03176
	SN	-0.00154	-0.08403	-1.20965
	SN	0.02447	0.02325	0.03031

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	0.01355	0.01073	-0.00913
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01208	0.01074	0.01966

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	0.01354	0.01073	-0.00862
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01208	0.01074	0.01956

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	0.01195	0.01027	0.00862
	SN	-0.00154	-0.10594	-1.77991
	SN	0.02590	0.02366	0.00752
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01047	0.00978	0.03114
	SN	-0.00154	-0.08397	-1.20834
	SN	0.02442	0.02318	0.03034

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	-0.00396	-0.00402	-0.00403
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01433	0.01425	0.05144
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00613	0.00614	0.04254
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00397	-0.00402	-0.00402
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01433	0.01425	0.05144
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00613	0.00613	0.04254

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	0.00406	0.00404	0.00403
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02372	0.02394	0.06181
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01184	0.01231	0.04977
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00405	0.00404	0.00402
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02372	0.02394	0.06180
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01184	0.01231	0.04977

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)	-0.00652	-0.00657	-0.00656
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00493	0.00510	0.04087
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)	-0.00652	-0.00657	-0.00656
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00493	0.00510	0.04086

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)	0.00658	0.00663	0.00659
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01377	0.01440	0.05118
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)	0.00658	0.00663	0.00659
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01377	0.01440	0.05118

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)	-0.00112	-0.00028	0.06268
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00144	-0.00033	0.06200
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00368	0.00604	0.12118
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00112	-0.00029	0.06268
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00144	-0.00033	0.06200
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00367	0.00604	0.12118

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)	0.03732	0.03878	0.11637
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01752	0.02010	0.08440
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03606	0.04020	0.14599
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01969	0.02203	0.08554
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02283	0.02745	0.14493
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03732	0.03878	0.11637
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01752	0.02010	0.08439
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03606	0.04021	0.14599
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01968	0.02203	0.08554
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02283	0.02745	0.14493

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00416	0.01159	2.27219	2.24827
sky130_osu_sc_15T_ms__dff_l	0.00416	0.01156	1.21022	1.21859

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__dff_1	0.00000	0.70341	0.88167
sky130_osu_sc_15T_ms__dff_l	0.00000	0.51760	0.69587

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)	0.17179	1.18726	16.55660
	QN->Q (FR)	0.02436	0.72966	11.84240
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.17913	1.24190	13.64550
	QN->Q (FR)	0.03530	0.89828	12.46490

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)	0.24270	1.29289	17.25160
	QN->Q (RF)	0.02336	0.67656	10.98660
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.25629	1.38403	14.63850
	QN->Q (RF)	0.02431	0.61714	8.62374

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)	0.21342	0.68578	6.85229
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.22302	0.78437	6.69879

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)	0.14177	0.57608	6.07436
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.13967	0.54609	4.41464

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)	-0.04403	-0.05708	0.01099
	setup	CK (R)	0.11681	0.16458	1.06906
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.04411	-0.05711	0.01037
	setup	CK (R)	0.11718	0.16251	1.07285

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)	-0.09312	-0.28182	-0.40589
	setup	CK (R)	0.11328	0.29340	2.92802
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.09179	-0.28182	-0.40971
	setup	CK (R)	0.11328	0.29340	2.92814

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 ()	0.07610	0.46143	13.33370
	min_pulse_width	CK ()	0.12817	0.46143	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.07263	0.46143	13.33370
	min_pulse_width	CK ()	0.12470	0.46143	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 ()**	0.16983	0.46143	13.33370
	min_pulse_width	**CK ()**	0.08999	0.46143	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.16983	0.46143	13.33370
	min_pulse_width	**CK ()**	0.08999	0.46143	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	0.01268	0.01062	0.00144
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01139	0.01074	0.03613

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	0.01380	0.01229	0.01061
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01240	0.01030	0.01042

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	0.01379	0.01229	0.01011
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01240	0.01031	0.01003

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	0.01263	0.01061	0.00179
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01134	0.01074	0.03521

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	-0.00327	-0.00389	-0.00396
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01338	0.01354	0.05115
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00327	-0.00389	-0.00396
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01338	0.01355	0.05116

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	0.00395	0.00399	0.00397
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02450	0.02482	0.06299
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00394	0.00399	0.00397
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02451	0.02483	0.06299

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)	-0.00111	-0.00027	0.06272
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00142	-0.00029	0.06205
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00111	-0.00027	0.06272
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00142	-0.00029	0.06205

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)	0.01742	0.02001	0.08431
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03639	0.03793	0.11639
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03662	0.04085	0.14822
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01958	0.02195	0.08544
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01742	0.02001	0.08431
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03639	0.03794	0.11640
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03663	0.04086	0.14822
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01958	0.02195	0.08544

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00404	2.08787
sky130_osu_sc_15T_ms__inv_10	0.03734	18.72948
sky130_osu_sc_15T_ms__inv_2	0.00766	4.04533
sky130_osu_sc_15T_ms__inv_3	0.01140	5.83380
sky130_osu_sc_15T_ms__inv_4	0.01505	7.82897
sky130_osu_sc_15T_ms__inv_6	0.02255	11.54800
sky130_osu_sc_15T_ms__inv_8	0.02995	15.24108
sky130_osu_sc_15T_ms__inv_l	0.00301	1.17289

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__inv_1	0.00000	0.11020	0.22012
sky130_osu_sc_15T_ms__inv_10	0.00000	1.10199	2.20113
sky130_osu_sc_15T_ms__inv_2	0.00000	0.22040	0.44023
sky130_osu_sc_15T_ms__inv_3	0.00000	0.33060	0.66034
sky130_osu_sc_15T_ms__inv_4	0.00000	0.44080	0.88045
sky130_osu_sc_15T_ms__inv_6	0.00000	0.66119	1.32068
sky130_osu_sc_15T_ms__inv_8	0.00000	0.88159	1.76091
sky130_osu_sc_15T_ms__inv_l	0.00000	0.01730	0.03418

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)**	0.02325	0.66453	10.51830
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03407	0.44046	10.39680
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.01899	0.56575	10.32630
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02109	0.53172	10.36980
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02163	0.50249	10.33100
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02474	0.46941	10.33810
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.02909	0.45013	10.35560
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.03041	0.75837	10.48390

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)**	0.02081	0.57970	9.19699
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03155	0.36592	9.06928
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01720	0.49484	9.06987
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01902	0.46186	9.17545
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01904	0.43107	9.14223
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02338	0.39971	9.14652
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02738	0.38032	9.14209
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02225	0.55554	7.70668

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	0.00620	0.00724	0.01751
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.05313	0.06860	0.16989
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.01092	0.01246	0.03376
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01679	0.02117	0.05072
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.02153	0.02681	0.06632
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.03198	0.04239	0.09956
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.04243	0.05587	0.13546
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00461	0.00477	0.01256

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	-0.00143	-0.00099	0.00342
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.02090	-0.01431	0.03049
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00431	-0.00330	0.00569
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00575	-0.00410	0.00930
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00871	-0.00512	0.01160
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.01325	-0.00889	0.01794
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01754	-0.01220	0.02431
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00087	-0.00061	0.00346

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	S0	Y
0	0	x	0
0	1	0	0
x	1	1	1
1	x	0	1
1	0	1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_15T_ms__mux2_1	0.02268	0.02252	0.00825	0.01659

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__mux2_1	0.00000	0.22123	0.22315

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)	-	0.01242	0.06741	0.16425
	A1->Y (RR)	-	0.01357	0.06848	0.16434
	S0->Y (RR)	(!A0 * A1)	0.04273	0.13886	-0.02083
	S0->Y (FR)	(A0 * !A1)	0.03046	0.17211	0.96373

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)	-	0.01249	0.07682	0.18202
	A1->Y (FF)	-	0.01180	0.07574	0.18149
	S0->Y (FF)	(!A0 * A1)	0.05147	0.20195	0.86831
	S0->Y (RF)	(A0 * !A1)	0.02400	0.11058	0.07164

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	-	-0.00625	-0.00626	-0.00627
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00418	-0.00418	-0.00420
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00763	0.01075	0.07601
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00435	-0.00281	0.06094

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	-	0.00625	0.00626	0.00627
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00419	0.00420	0.00420
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00101	0.00296	0.06790
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01676	0.01946	0.08382

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)	-0.00149	-0.00149	-0.00149

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)	0.00149	0.00149	0.00149

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)	-0.00178	-0.00177	-0.00178

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)	0.00178	0.00177	0.00178

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)	-0.00170	0.00002	0.06429
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00165	-0.00006	0.06450

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)	0.01278	0.01566	0.08020
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01162	0.01476	0.07977

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00404	0.00402	1.74061
sky130_osu_sc_15T_ms__nand2_l	0.00301	0.00301	1.16173

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nand2_1	0.00000	0.11022	0.44023
sky130_osu_sc_15T_ms__nand2_l	0.00000	0.01731	0.06836

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)	0.02393	0.62789	9.50147
	B->Y (FR)	0.02841	0.62475	9.35669
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.03119	0.76092	10.45770
	B->Y (FR)	0.03763	0.76323	10.43170

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)	0.02940	0.68501	10.37480
	B->Y (RF)	0.03370	0.66022	9.95519
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.03176	0.70546	9.63678
	B->Y (RF)	0.03554	0.68181	9.15981

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	0.00659	0.00727	0.01639
	B	0.00000	0.00000	0.00000
	B	0.00842	0.00925	0.01952
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00486	0.00546	0.01182
	B	0.00000	0.00000	0.00000
	B	0.00615	0.00612	0.01315

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	-0.00102	-0.00083	0.00366
	B	0.00000	0.00000	0.00000
	B	-0.00097	-0.00094	0.00269
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00064	-0.00038	0.00308
	B	0.00000	0.00000	0.00000
	B	-0.00061	-0.00059	0.00237

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)	-0.00450	-0.00448	-0.00453
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00310	-0.00311	-0.00312

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)	0.00451	0.00462	0.00454
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00311	0.00318	0.00313

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)	-0.00418	-0.00419	-0.00418
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00289	-0.00290	-0.00289

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)	0.00422	0.00424	0.00419
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00292	0.00292	0.00290

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00402	0.00430	1.13016
sky130_osu_sc_15T_ms__nor2_l	0.00291	0.00323	0.69811

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__nor2_1	0.00000	0.07964	0.22011
sky130_osu_sc_15T_ms__nor2_l	0.00000	0.01342	0.03418

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)	0.04886	0.76266	10.07540
	B->Y (FR)	0.03717	0.76580	10.34670
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.05871	0.86952	10.05370
	B->Y (FR)	0.04827	0.87962	10.42660

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)	0.02888	0.48467	6.47022
	B->Y (RF)	0.02232	0.47347	6.45245
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02849	0.47569	5.67312
	B->Y (RF)	0.02358	0.46779	5.65817

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	0.00895	0.00901	0.01603
	B	0.00000	0.00000	0.00000
	B	0.00677	0.00759	0.02054
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00631	0.00633	0.01200
	B	0.00000	0.00000	0.00000
	B	0.00496	0.00545	0.01434

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	0.00091	0.00114	0.00719
	B	0.00000	0.00000	0.00000
	B	-0.00110	-0.00064	0.00537
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00055	0.00079	0.00602
	B	0.00000	0.00000	0.00000
	B	-0.00062	-0.00032	0.00484

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)	-0.00330	-0.00398	-0.00399
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00224	-0.00265	-0.00264

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)	0.00396	0.00401	0.00399
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00262	0.00265	0.00264

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)	-0.00188	-0.00192	-0.00189
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00123	-0.00125	-0.00123

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)	0.00196	0.00199	0.00191
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00128	0.00129	0.00124

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	0	x	1
x	1	0	1
x	1	1	0
1	x	0	1
1	x	1	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00404	0.00413	0.00342	1.08546

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai21_l	0.00000	0.05275	0.25430

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)	0.05253	0.78461	10.30100
	A1->Y (FR)	0.06751	0.78720	10.05140
	B0->Y (FR)	0.03681	0.71274	9.56866

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)	0.04138	0.57718	7.47481
	A1->Y (RF)	0.04968	0.56962	7.26615
	B0->Y (RF)	0.03189	0.61516	8.23429

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	0.00939	0.01011	0.02118
	A1	0.00000	0.00000	0.00000
	A1	0.01157	0.01151	0.01795
	B0	0.00762	0.00812	0.01631

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	0.00011	0.00007	0.00451
	A1	0.00000	0.00000	0.00000
	A1	0.00212	0.00186	0.00637
	B0	0.00077	0.00092	0.00545

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)	-0.00188	-0.00191	-0.00189
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00396	-0.00403	-0.00401
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00406	-0.00409	-0.00407

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)	0.00198	0.00199	0.00192
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00400	0.00403	0.00401
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00406	0.00409	0.00408

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)	-0.00319	-0.00392	-0.00390
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00390	-0.00400	-0.00397
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00401	-0.00402	-0.00402

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)	0.00388	0.00392	0.00391
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00395	0.00400	0.00397
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00401	0.00405	0.00403

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)	-0.00319	-0.00320	-0.00325

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)	0.00324	0.00326	0.00326

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	0	x	x	1
x	1	0	0	1
x	1	x	1	0
x	1	1	x	0
1	x	0	0	1
1	x	x	1	0
1	x	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00392	0.00414	0.00426	0.00416	1.12573

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__oai22_1	0.00000	0.11946	0.44022

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)	0.07305	0.78845	10.09120
	A1->Y (FR)	0.06127	0.78975	10.36330
	B0->Y (FR)	0.04042	0.76984	10.35310
	B1->Y (FR)	0.05484	0.77147	10.08780

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)	0.07132	0.62367	7.74106
	A1->Y (RF)	0.05692	0.60466	7.67344
	B0->Y (RF)	0.04810	0.63802	8.43514
	B1->Y (RF)	0.06313	0.66293	8.54419

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	0.01505	0.01501	0.02126
	A1	0.01283	0.01292	0.02438
	B0	0.00713	0.00784	0.01982
	B1	0.01170	0.01171	0.01785

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00362	0.00334	0.00765
	A1	-0.00047	-0.00051	0.00391
	B0	-0.00051	-0.00029	0.00537
	B1	0.00144	0.00155	0.00687

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)	-0.00329	-0.00398	-0.00399
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00329	-0.00398	-0.00399
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00394	-0.00400	-0.00398
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00402	-0.00404	-0.00403

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)	0.00397	0.00401	0.00399
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00397	0.00401	0.00399
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00395	0.00400	0.00398
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00402	0.00406	0.00404

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)	-0.00186	-0.00191	-0.00187
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00186	-0.00191	-0.00187
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00389	-0.00396	-0.00394
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00399	-0.00401	-0.00400

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)	0.00196	0.00197	0.00190
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00194	0.00197	0.00190
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00392	0.00396	0.00394
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00399	0.00402	0.00401

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)	-0.00185	-0.00189	-0.00186
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00185	-0.00189	-0.00186
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00436	-0.00444	-0.00441
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00437	-0.00440	-0.00445

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)	0.00193	0.00196	0.00188
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00193	0.00195	0.00188
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00441	0.00446	0.00441
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00445	0.00448	0.00447

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)	-0.00322	-0.00390	-0.00391
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00322	-0.00390	-0.00391
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00445	-0.00454	-0.00450
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00446	-0.00447	-0.00454

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)	0.00389	0.00393	0.00392
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00389	0.00394	0.00392
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00450	0.00455	0.00450
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00454	0.00455	0.00456

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__or2_1	10.37850
sky130_osu_sc_15T_ms__or2_2	12.82050
sky130_osu_sc_15T_ms__or2_4	17.70450
sky130_osu_sc_15T_ms__or2_8	27.47250
sky130_osu_sc_15T_ms__or2_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00438	0.00414	2.15606
sky130_osu_sc_15T_ms__or2_2	0.00438	0.00414	4.21937
sky130_osu_sc_15T_ms__or2_4	0.00438	0.00414	8.07735
sky130_osu_sc_15T_ms__or2_8	0.00438	0.00415	15.44016
sky130_osu_sc_15T_ms__or2_l	0.00332	0.00307	1.20305

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__or2_1	0.00000	0.13488	0.22068
sky130_osu_sc_15T_ms__or2_2	0.00000	0.19012	0.44080
sky130_osu_sc_15T_ms__or2_4	0.00000	0.30061	0.88102
sky130_osu_sc_15T_ms__or2_8	0.00000	0.52157	1.76148
sky130_osu_sc_15T_ms__or2_l	0.00000	0.02227	0.03500

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)	0.06210	0.53749	6.60436
	B->Y (RR)	0.05354	0.50847	6.54392
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.06857	0.47883	6.62402
	B->Y (RR)	0.05970	0.45337	6.55021
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.08935	0.47711	6.81322
	B->Y (RR)	0.08036	0.45611	6.74644
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.12914	0.52660	7.14909
	B->Y (RR)	0.12008	0.51069	7.08199
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.06839	0.61746	6.25695
	B->Y (RR)	0.06050	0.59118	6.15652

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)	0.09522	0.59109	6.92127
	B->Y (FF)	0.07933	0.57739	7.03522
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.11211	0.56263	7.02183
	B->Y (FF)	0.09639	0.55555	7.10126
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.15731	0.59692	7.29622
	B->Y (FF)	0.14161	0.59854	7.34925
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.25100	0.69886	7.57122
	B->Y (FF)	0.23535	0.70649	7.62396
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.11091	0.59952	5.71009
	B->Y (FF)	0.09322	0.59351	5.81980

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	0.00671	0.00689	0.03646
	B	0.00000	0.00000	0.00000
	B	0.00488	0.00620	0.04502
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01152	0.01207	0.04224
	B	0.00000	0.00000	0.00000
	B	0.00960	0.01123	0.04974
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02227	0.02320	0.07285
	B	0.00000	0.00000	0.00000
	B	0.02026	0.02234	0.06194
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04538	0.04621	0.07691
	B	0.00000	0.00000	0.00000
	B	0.04338	0.04573	0.08259
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00481	0.00511	0.02533
	B	0.00000	0.00000	0.00000
	B	0.00365	0.00456	0.02765

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	0.01464	0.01510	0.04487
	B	0.00000	0.00000	0.00000
	B	0.01209	0.01495	0.06742
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01816	0.01883	0.04883
	B	0.00000	0.00000	0.00000
	B	0.01555	0.01861	0.06960
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02804	0.02807	0.05768
	B	0.00000	0.00000	0.00000
	B	0.02543	0.02770	0.07595
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.05400	0.04664	0.07526
	B	0.00000	0.00000	0.00000
	B	0.05142	0.04694	0.09107
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01078	0.01082	0.03258
	B	0.00000	0.00000	0.00000
	B	0.00902	0.01062	0.04339

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)	-0.00331	-0.00402	-0.00401
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00331	-0.00402	-0.00401
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00331	-0.00402	-0.00401
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00331	-0.00403	-0.00401
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00225	-0.00268	-0.00267

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)	0.00398	0.00403	0.00402
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00398	0.00403	0.00402
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00398	0.00403	0.00402
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00398	0.00403	0.00402
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00265	0.00268	0.00267

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)	-0.00188	-0.00193	-0.00189
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00193	-0.00189
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00193	-0.00189
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00188	-0.00193	-0.00189
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00126	-0.00127	-0.00126

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)	0.00198	0.00200	0.00192
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00198	0.00200	0.00192
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00198	0.00200	0.00192
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00198	0.00200	0.00192
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00131	0.00133	0.00128

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00428	0.00551	1.14052
sky130_osu_sc_15T_ms__tbufi_l	0.00323	0.00420	0.69604

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tbufi_1	0.00000	0.11041	0.44023
sky130_osu_sc_15T_ms__tbufi_l	0.00000	0.01757	0.06836

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)	0.03536	0.76222	10.33760
	OE->Y (FR)	0.04112	0.35670	5.24790
	OE->Y (RR)	0.06776	0.61491	6.67789
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.04652	0.87757	10.40680
	OE->Y (FR)	0.04675	0.35650	5.24768
	OE->Y (RR)	0.07661	0.71208	6.42180

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)	0.02890	0.58449	7.97116
	OE->Y (FF)	0.04143	0.35668	5.24786
	OE->Y (RF)	0.02804	0.55789	7.49536
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.03161	0.58269	7.03239
	OE->Y (FF)	0.04757	0.35649	5.24768
	OE->Y (RF)	0.02994	0.55120	6.49140

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	0.00634	0.00710	0.01843
	OE	0.00000	0.00000	0.00000
	OE	0.00624	0.00789	0.06280
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00467	0.00510	0.01304
	OE	0.00000	0.00000	0.00000
	OE	0.00438	0.00551	0.04231

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	-0.00111	-0.00073	0.00454
	OE	0.00000	0.00000	0.00000
	OE	0.00393	0.00570	0.06989
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00063	-0.00038	0.00418
	OE	0.00000	0.00000	0.00000
	OE	0.00265	0.00385	0.04664

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)	-0.00315	-0.00319	-0.00315
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00276	-0.00279	-0.00277
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00224	-0.00228	-0.00225
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00199	-0.00200	-0.00199

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)	0.00315	0.00319	0.00315
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00282	0.00285	0.00279
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00224	0.00228	0.00225
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00202	0.00204	0.00200

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)	0.00235	0.00427	0.06986
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00208	0.00401	0.06954
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00154	0.00282	0.04618
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00136	0.00266	0.04595

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)	0.00752	0.01040	0.07589
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00751	0.01041	0.07602
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00569	0.00738	0.05051
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00574	0.00746	0.05060

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tnbufi_1	0.00428	0.00658	1.14041
sky130_osu_sc_15T_ms__tnbufi_l	0.00323	0.00472	0.69593

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__tnbufi_1	0.00000	0.18369	0.22040
sky130_osu_sc_15T_ms__tnbufi_l	0.00000	0.02883	0.03459

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)	0.03560	0.76213	10.33680
	OE->Y (RR)	0.02718	0.35727	5.24840
	OE->Y (FR)	0.04571	0.75762	10.04130
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.04679	0.87740	10.40560
	OE->Y (RR)	0.02717	0.35720	5.24838
	OE->Y (FR)	0.05601	0.86719	10.00480

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)	0.02845	0.58432	7.97058
	OE->Y (RF)	0.02697	0.35726	5.24839
	OE->Y (FF)	0.04834	0.48795	5.38032
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.03103	0.58242	7.03182
	OE->Y (RF)	0.02701	0.35718	5.24838
	OE->Y (FF)	0.05519	0.51581	4.82981

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	0.00652	0.00727	0.01860
	OE	0.00000	0.00000	0.00000
	OE	0.01594	0.01937	0.08531
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00486	0.00528	0.01323
	OE	0.00000	0.00000	0.00000
	OE	0.01143	0.01353	0.05681

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	-0.00136	-0.00095	0.00432
	OE	0.00000	0.00000	0.00000
	OE	0.01387	0.01778	0.07321
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00087	-0.00060	0.00395
	OE	0.00000	0.00000	0.00000
	OE	0.00987	0.01226	0.05035

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)	-0.00267	-0.00270	-0.00267
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00232	-0.00234	-0.00232
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00179	-0.00181	-0.00180
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00156	-0.00157	-0.00156

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)	0.00267	0.00270	0.00267
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00237	0.00239	0.00234
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00179	0.00181	0.00180
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00159	0.00160	0.00157

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)	-0.00467	-0.00306	0.06321
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00473	-0.00305	0.06326
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00301	-0.00196	0.04180
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00301	-0.00189	0.04183

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)	0.01203	0.01588	0.08222
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01185	0.01612	0.08210
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00857	0.01089	0.05459
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00846	0.01105	0.05449

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00850	0.00759	1.16151

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.37789	0.66063

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (RR)	B	0.08504	0.64694	6.79919
	A->Y (FR)	!B	0.04710	0.77514	10.38860
	B->Y (RR)	A	0.06852	0.63132	6.87457
	B->Y (FR)	!A	0.06358	0.77557	10.13220

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_l	A->Y (FF)	B	0.08451	0.55898	5.69146
	A->Y (RF)	!B	0.04002	0.57038	7.59874
	B->Y (FF)	A	0.07241	0.54839	5.69634
	B->Y (RF)	!A	0.05082	0.58410	7.60019

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	0.00629	0.00757	0.06315
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01576	0.01899	0.09490
	B	A	0.00000	0.00000	0.00000
	B	A	0.00211	0.00407	0.06975
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01720	0.02003	0.09013

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	0.01925	0.02131	0.08540
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00399	0.00557	0.07384
	B	A	0.00000	0.00000	0.00000
	B	A	0.01734	0.02050	0.08650
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00541	0.00687	0.07457

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00853	0.00763	1.16994

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xor2_l	0.00000	0.37789	0.62882

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	0.08463	0.65062	7.04027
	A->Y (FR)	B	0.05897	0.78353	10.34850
	B->Y (RR)	!A	0.07229	0.64725	7.06119
	B->Y (FR)	A	0.06501	0.78895	10.32740

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	0.07468	0.55437	5.62753
	A->Y (RF)	B	0.04194	0.60923	8.09669
	B->Y (FF)	!A	0.07022	0.55185	5.75266
	B->Y (RF)	A	0.05039	0.58784	7.64789

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	0.01849	0.02140	0.09215
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00327	0.00376	0.06722
	B	A	0.00000	0.00000	0.00000
	B	A	0.01902	0.02194	0.09088
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00194	0.00367	0.06928

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	0.00342	0.00482	0.07427
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01972	0.02268	0.07804
	B	A	0.00000	0.00000	0.00000
	B	A	0.00349	0.00477	0.07155
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01762	0.02094	0.08647

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P89_25C.ccs
Cell Library: Process , Voltage 1.89,
Temp 25.00

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	0.70449
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	331234.00000	662468.00000
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
	-0.00185	0.08897	1.27901

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
	5.76477	5.48557	1.53169