sky130_osu_sc_15T_ms_tt_1P80_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_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addf_1	39.07200
sky130_osu_sc_15T_ms__addf_l	39.07200

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	B	CI	CO	CON	S
sky130_osu_sc_15T_ms__addf_1	0.01551	0.01551	0.01195	2.08309	0.96756	1.98367
sky130_osu_sc_15T_ms__addf_l	0.01551	0.01550	0.01197	1.25571	0.97203	1.28580

Leakage Information

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

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.13790	1.66479	25.81340
	B->CO (RR)	0.12046	1.60026	24.93050
	CI->CO (RR)	0.13032	1.69227	26.34480
	CON->CO (FR)	0.02370	0.69692	10.94740
sky130_osu_sc_15T_ms__addf_1	A->CO (RR)	0.14307	1.53279	19.78620
	B->CO (RR)	0.13850	1.49539	19.38380
	CI->CO (RR)	0.13550	1.56130	20.35300
	CON->CO (FR)	0.03007	0.79220	11.03060

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)	0.18435	2.06944	31.88920
	B->CO (FF)	0.16472	1.97268	30.62020
	CI->CO (FF)	0.16209	2.05970	32.14340
	CON->CO (RF)	0.02222	0.61192	9.62707
sky130_osu_sc_15T_ms__addf_1	A->CO (FF)	0.17858	1.73538	22.14300
	B->CO (FF)	0.15944	1.66088	21.48340
	CI->CO (FF)	0.15634	1.72666	22.43690
	CON->CO (RF)	0.02388	0.60481	8.42961

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)	0.13684	0.90072	10.31600
	B->CON (FR)	0.11860	0.85593	10.11900
	CI->CON (FR)	0.11459	0.89339	10.63930
sky130_osu_sc_15T_ms__addf_l	A->CON (FR)	0.12939	0.89492	10.33910
	B->CON (FR)	0.11176	0.85059	10.14100
	CI->CON (FR)	0.10716	0.88765	10.66270

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)	0.09055	0.63547	7.40799
	B->CON (RF)	0.08754	0.63756	7.59847
	CI->CON (RF)	0.08294	0.66591	8.02323
sky130_osu_sc_15T_ms__addf_l	A->CON (RF)	0.08660	0.63292	7.42512
	B->CON (RF)	0.08384	0.63636	7.61522
	CI->CON (RF)	0.07897	0.66181	8.04007

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)	0.26771	1.84647	24.60320
	B->S (-R)	0.27677	1.83432	23.76060
	CI->S (-R)	0.24372	1.83297	24.86290
	CON->S (RR)	0.07548	0.60864	7.17519
sky130_osu_sc_15T_ms__addf_l	A->S (-R)	0.25780	1.69043	19.62440
	B->S (-R)	0.26713	1.69091	19.15140
	CI->S (-R)	0.23366	1.67830	19.90840
	CON->S (RR)	0.07744	0.67249	7.13371

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)	0.22779	1.50716	19.12900
	B->S (-F)	0.22779	1.46160	18.55240
	CI->S (-F)	0.21953	1.53171	19.65810
	CON->S (FF)	0.09220	0.64290	6.92257
sky130_osu_sc_15T_ms__addf_l	A->S (-F)	0.21341	1.33557	14.78170
	B->S (-F)	0.20840	1.29084	14.57610
	CI->S (-F)	0.20506	1.36079	15.34640
	CON->S (FF)	0.08742	0.63631	6.18743

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	0.00320	0.00395	0.02040
	B	0.00497	0.00539	0.01933
	CI	0.00496	0.00581	0.02253
sky130_osu_sc_15T_ms__addf_l	A	0.00234	0.00275	0.01228
	B	0.00411	0.00420	0.01283
	CI	0.00410	0.00460	0.01424

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01272	0.01369	0.03945
	B	0.01340	0.01420	0.03680
	CI	0.01074	0.01181	0.03818
sky130_osu_sc_15T_ms__addf_l	A	0.01190	0.01251	0.02747
	B	0.01256	0.01307	0.02593
	CI	0.00991	0.01064	0.02663

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01271	0.01322	0.02488
	B	0.01313	0.01355	0.02410
	CI	0.01072	0.01137	0.02426
sky130_osu_sc_15T_ms__addf_l	A	0.01188	0.01237	0.02393
	B	0.01233	0.01269	0.02316
	CI	0.00990	0.01052	0.02328

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.00318	0.00361	0.01170
	B	0.00370	0.00410	0.01148
	CI	0.00494	0.00549	0.01401
sky130_osu_sc_15T_ms__addf_l	A	0.00233	0.00266	0.01020
	B	0.00286	0.00314	0.01001
	CI	0.00409	0.00450	0.01246

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.01272	0.01366	0.03789
	B	0.01339	0.01417	0.03530
	CI	0.01073	0.01177	0.03666
sky130_osu_sc_15T_ms__addf_l	A	0.01189	0.01253	0.02776
	B	0.01256	0.01308	0.02627
	CI	0.00992	0.01065	0.02691

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__addf_1	A	0.02822	0.02852	0.04667
	B	0.02532	0.02571	0.05223
	CI	0.02309	0.02304	0.04059
sky130_osu_sc_15T_ms__addf_l	A	0.02707	0.02713	0.04572
	B	0.02417	0.02463	0.05199
	CI	0.02194	0.02188	0.04017

SKY130_OSU_SC_15T_MS__ADDHx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__addh_1	23.19900
sky130_osu_sc_15T_ms__addh_l	23.19900

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_15T_ms__addh_1	0.00761	0.00842	2.05603	1.04496	2.09496
sky130_osu_sc_15T_ms__addh_l	0.00761	0.00842	1.31519	1.04026	1.33711

Leakage Information

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

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__addh_1	A->CO (RR)	0.09214	0.62930	7.15735
	B->CO (RR)	0.09562	0.62470	7.22566
sky130_osu_sc_15T_ms__addh_l	A->CO (RR)	0.09572	0.69548	7.12288
	B->CO (RR)	0.09924	0.69213	7.16192

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)	0.07793	0.61008	6.91996
	B->CO (FF)	0.08341	0.62481	6.94887
sky130_osu_sc_15T_ms__addh_l	A->CO (FF)	0.07412	0.56057	5.42530
	B->CO (FF)	0.07929	0.57506	5.45402

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	0.12684	0.51806	3.80339
	A->CON (FR)	!B	0.07410	0.83106	10.51430
	B->CON (RR)	A	0.13002	0.51250	3.87573
	B->CON (FR)	!A	0.09131	0.83954	10.32760
sky130_osu_sc_15T_ms__addh_l	A->CON (RR)	B	0.11683	0.50049	3.78060
	A->CON (FR)	!B	0.06738	0.82260	10.47780
	B->CON (RR)	A	0.12001	0.49613	3.82219
	B->CON (FR)	!A	0.08455	0.83130	10.29040

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	0.12294	0.65235	5.72754
	A->CON (RF)	!B	0.05311	0.63706	8.18962
	B->CON (FF)	A	0.12076	0.68219	6.03838
	B->CON (RF)	!A	0.06437	0.63075	7.90913
sky130_osu_sc_15T_ms__addh_l	A->CON (FF)	B	0.11421	0.63304	5.63357
	A->CON (RF)	!B	0.04944	0.63207	8.16437
	B->CON (FF)	A	0.11199	0.66217	5.94185
	B->CON (RF)	!A	0.06077	0.62616	7.88568

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	0.09552	1.62705	25.98390
	A->S (FR)	B	0.16604	1.62699	23.30750
	B->S (RR)	!A	0.10717	1.58641	25.03260
	B->S (FR)	A	0.16409	1.69097	24.29200
	CON->S (FR)	-	0.02592	0.71456	11.23000
sky130_osu_sc_15T_ms__addh_l	A->S (RR)	!B	0.09721	1.51023	20.68970
	A->S (FR)	B	0.16285	1.49815	17.97790
	B->S (RR)	!A	0.10898	1.47982	20.02700
	B->S (FR)	A	0.16071	1.55189	18.66840
	CON->S (FR)	-	0.03040	0.80047	11.30150

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	0.11414	1.88372	30.11440
	A->S (RF)	B	0.16109	1.28682	17.58310
	B->S (FF)	!A	0.13137	1.89558	29.99690
	B->S (RF)	A	0.16423	1.28122	17.64890
	CON->S (RF)	-	0.02097	0.60082	9.46160
sky130_osu_sc_15T_ms__addh_l	A->S (FF)	!B	0.10841	1.62551	22.20510
	A->S (RF)	B	0.15179	1.12994	12.75020
	B->S (FF)	!A	0.12565	1.63637	22.04690
	B->S (RF)	A	0.15500	1.12393	12.78770
	CON->S (RF)	-	0.02258	0.60666	8.62074

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	0.00598	0.00594	0.01391
	B	0.00000	0.00000	0.00000
	B	0.00539	0.00522	0.01485
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00517	0.00509	0.01454
	B	0.00000	0.00000	0.00000
	B	0.00458	0.00437	0.01483

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	0.00913	0.00925	0.02248
	B	0.00000	0.00000	0.00000
	B	0.00949	0.01014	0.02404
sky130_osu_sc_15T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00835	0.00841	0.02059
	B	0.00000	0.00000	0.00000
	B	0.00871	0.00919	0.02141

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	0.00597	0.00594	0.01432
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00810	0.00839	0.01280
	B	A	0.00000	0.00000	0.00000
	B	A	0.00538	0.00522	0.01528
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00906	0.00911	0.01184
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00517	0.00509	0.01464
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00754	0.00778	0.01182
	B	A	0.00000	0.00000	0.00000
	B	A	0.00458	0.00437	0.01470
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00851	0.00847	0.01081

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	0.00914	0.00923	0.02150
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00120	0.00141	0.00450
	B	A	0.00000	0.00000	0.00000
	B	A	0.00949	0.01006	0.02298
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00216	0.00219	0.00475
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00835	0.00842	0.02057
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00046	0.00058	0.00266
	B	A	0.00000	0.00000	0.00000
	B	A	0.00871	0.00917	0.02149
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00142	0.00138	0.00344

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	0.00914	0.00926	0.02264
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00122	0.00151	0.00553
	B	A	0.00000	0.00000	0.00000
	B	A	0.00950	0.01015	0.02413
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00219	0.00230	0.00593
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00836	0.00841	0.02092
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00048	0.00059	0.00260
	B	A	0.00000	0.00000	0.00000
	B	A	0.00872	0.00920	0.02169
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00144	0.00141	0.00322

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	0.00598	0.00595	0.01384
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00810	0.00847	0.01301
	B	A	0.00000	0.00000	0.00000
	B	A	0.00539	0.00523	0.01474
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00907	0.00927	0.01281
sky130_osu_sc_15T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00517	0.00508	0.01445
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00755	0.00780	0.01149
	B	A	0.00000	0.00000	0.00000
	B	A	0.00459	0.00437	0.01492
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00852	0.00855	0.01088

SKY130_OSU_SC_15T_MS__AND2x

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__and2_1	0.00409	0.00420	2.06800
sky130_osu_sc_15T_ms__and2_2	0.00409	0.00420	4.00803
sky130_osu_sc_15T_ms__and2_4	0.00409	0.00420	7.61573
sky130_osu_sc_15T_ms__and2_6	0.00413	0.00420	11.20918
sky130_osu_sc_15T_ms__and2_8	0.00410	0.00421	14.56975
sky130_osu_sc_15T_ms__and2_l	0.00309	0.00320	1.26296

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__and2_1	0.00000	0.21362	0.34172
sky130_osu_sc_15T_ms__and2_2	0.00000	0.34174	0.34197
sky130_osu_sc_15T_ms__and2_4	0.00000	0.59796	0.68319
sky130_osu_sc_15T_ms__and2_6	0.00000	0.85419	1.02466
sky130_osu_sc_15T_ms__and2_8	0.00000	1.11041	1.36612
sky130_osu_sc_15T_ms__and2_l	0.00000	0.03304	0.05277

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__and2_1	A->Y (RR)	0.07014	0.56744	7.05947
	B->Y (RR)	0.07488	0.56850	6.93248
sky130_osu_sc_15T_ms__and2_2	A->Y (RR)	0.08099	0.52039	7.06750
	B->Y (RR)	0.08577	0.51662	6.95195
sky130_osu_sc_15T_ms__and2_4	A->Y (RR)	0.11177	0.53838	7.24504
	B->Y (RR)	0.11655	0.52580	7.14651
sky130_osu_sc_15T_ms__and2_6	A->Y (RR)	0.14198	0.57663	7.45227
	B->Y (RR)	0.14667	0.55788	7.35376
sky130_osu_sc_15T_ms__and2_8	A->Y (RR)	0.17176	0.61799	7.65315
	B->Y (RR)	0.17655	0.59519	7.54973
sky130_osu_sc_15T_ms__and2_l	A->Y (RR)	0.07926	0.65107	6.87337
	B->Y (RR)	0.08422	0.65117	6.75540

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)	0.06060	0.54412	6.51474
	B->Y (FF)	0.06397	0.55852	6.55015
sky130_osu_sc_15T_ms__and2_2	A->Y (FF)	0.06902	0.50965	6.50799
	B->Y (FF)	0.07275	0.52135	6.55783
sky130_osu_sc_15T_ms__and2_4	A->Y (FF)	0.09520	0.52926	6.62782
	B->Y (FF)	0.09860	0.53724	6.68182
sky130_osu_sc_15T_ms__and2_6	A->Y (FF)	0.12372	0.56767	6.79624
	B->Y (FF)	0.12660	0.57381	6.84776
sky130_osu_sc_15T_ms__and2_8	A->Y (FF)	0.15027	0.60273	6.86466
	B->Y (FF)	0.15283	0.60733	6.91457
sky130_osu_sc_15T_ms__and2_l	A->Y (FF)	0.06884	0.58447	5.90377
	B->Y (FF)	0.07380	0.60097	5.96638

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	0.00430	0.00474	0.04127
	B	0.00000	0.00000	0.00000
	B	0.00438	0.00422	0.02706
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00861	0.00925	0.04431
	B	0.00000	0.00000	0.00000
	B	0.00871	0.00882	0.03067
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01829	0.01927	0.05226
	B	0.00000	0.00000	0.00000
	B	0.01843	0.01890	0.03992
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02862	0.02946	0.05960
	B	0.00000	0.00000	0.00000
	B	0.02879	0.02928	0.04946
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03952	0.03965	0.07156
	B	0.00000	0.00000	0.00000
	B	0.03979	0.03934	0.06041
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00311	0.00343	0.02727
	B	0.00000	0.00000	0.00000
	B	0.00320	0.00304	0.01833

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	0.01112	0.01275	0.04650
	B	0.00000	0.00000	0.00000
	B	0.01258	0.01394	0.04559
sky130_osu_sc_15T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01408	0.01615	0.04946
	B	0.00000	0.00000	0.00000
	B	0.01559	0.01723	0.04879
sky130_osu_sc_15T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.02171	0.02448	0.05736
	B	0.00000	0.00000	0.00000
	B	0.02316	0.02541	0.05638
sky130_osu_sc_15T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02980	0.03276	0.06526
	B	0.00000	0.00000	0.00000
	B	0.03112	0.03364	0.06450
sky130_osu_sc_15T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.03848	0.04115	0.07348
	B	0.00000	0.00000	0.00000
	B	0.04011	0.04153	0.07215
sky130_osu_sc_15T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00845	0.00940	0.03071
	B	0.00000	0.00000	0.00000
	B	0.00947	0.01023	0.03018

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)	-0.00412	-0.00413	-0.00414
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00412	-0.00412	-0.00414
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00411	-0.00412	-0.00414
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00414	-0.00414	-0.00416
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00410	-0.00411	-0.00413
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00290	-0.00290	-0.00292

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)	0.00414	0.00423	0.00416
sky130_osu_sc_15T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00414	0.00423	0.00416
sky130_osu_sc_15T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00414	0.00423	0.00416
sky130_osu_sc_15T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00417	0.00426	0.00419
sky130_osu_sc_15T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00415	0.00424	0.00417
sky130_osu_sc_15T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00292	0.00298	0.00293

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00393	-0.00391
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00393	-0.00391
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00390	-0.00393	-0.00391
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00389	-0.00392	-0.00390
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00389	-0.00391	-0.00390
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00276	-0.00277	-0.00276

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00394	0.00398	0.00392
sky130_osu_sc_15T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00394	0.00398	0.00392
sky130_osu_sc_15T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00394	0.00398	0.00393
sky130_osu_sc_15T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00395	0.00398	0.00393
sky130_osu_sc_15T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00395	0.00398	0.00393
sky130_osu_sc_15T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00279	0.00281	0.00277

SKY130_OSU_SC_15T_MS__AOI21

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__aoi21_l	0.00387	0.00403	0.00390	0.93556

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi21_l	A0->Y (FR)	0.07354	0.84374	10.25580
	A1->Y (FR)	0.06121	0.79876	9.86724
	B0->Y (FR)	0.05367	0.84035	10.58120

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)	0.04871	0.56790	6.96341
	A1->Y (RF)	0.04429	0.58911	7.41911
	B0->Y (RF)	0.02859	0.55300	7.16667

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	0.00987	0.00979	0.01301
	A1	0.00000	0.00000	0.00000
	A1	0.00826	0.00815	0.01135
	B0	0.00597	0.00628	0.01353

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	0.00207	0.00176	0.00411
	A1	0.00000	0.00000	0.00000
	A1	0.00212	0.00195	0.00494
	B0	-0.00103	-0.00086	0.00231

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)	-0.00302	-0.00358	-0.00358
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00362	-0.00364	-0.00362
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00362	-0.00364	-0.00363

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00356	0.00361	0.00358
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00362	0.00365	0.00364
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00365	0.00367	0.00364

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)	-0.00299	-0.00350	-0.00353
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00356	-0.00357	-0.00356
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00386	-0.00389	-0.00389

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00350	0.00350	0.00353
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00356	0.00358	0.00358
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00388	0.00390	0.00390

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00170	-0.00174	-0.00171

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)	0.00185	0.00188	0.00175

SKY130_OSU_SC_15T_MS__AOI22

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__aoi22_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	0.00386	0.00401	0.00415	0.00395	0.96238

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_15T_ms__aoi22_l	0.00000	0.09142	0.34147

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__aoi22_l	A0->Y (FR)	0.08997	0.85870	10.29650
	A1->Y (FR)	0.07995	0.84028	10.19460
	B0->Y (FR)	0.05445	0.82769	10.48810
	B1->Y (FR)	0.06468	0.84938	10.65010

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)	0.06438	0.59043	7.10156
	A1->Y (RF)	0.05986	0.61115	7.55736
	B0->Y (RF)	0.03252	0.58057	7.53073
	B1->Y (RF)	0.03701	0.55929	7.07578

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	0.01201	0.01190	0.01512
	A1	0.01041	0.01028	0.01359
	B0	0.00651	0.00678	0.01424
	B1	0.00809	0.00847	0.01578

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	A0	0.00432	0.00398	0.00633
	A1	0.00436	0.00413	0.00718
	B0	-0.00073	-0.00060	0.00249
	B1	-0.00064	-0.00073	0.00170

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)	-0.00305	-0.00357	-0.00358
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00362	-0.00364	-0.00362
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00361	-0.00364	-0.00362
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00361	-0.00364	-0.00362

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)	0.00357	0.00359	0.00358
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00362	0.00366	0.00364
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00365	0.00367	0.00363
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00365	0.00367	0.00363

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)	-0.00302	-0.00352	-0.00352
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00356	-0.00358	-0.00356
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00386	-0.00388	-0.00388
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00386	-0.00388	-0.00388

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00350	0.00353	0.00352
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00356	0.00358	0.00358
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00388	0.00389	0.00390
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00388	0.00388	0.00390

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00171	-0.00175	-0.00172
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00171	-0.00172	-0.00172
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00400	-0.00402	-0.00402
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00400	-0.00400	-0.00402

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)	0.00193	0.00195	0.00177
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00171	0.00173	0.00172
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00401	0.00404	0.00403
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00401	0.00404	0.00403

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00173	-0.00177	-0.00173
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00172	-0.00173	-0.00173
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00368	-0.00371	-0.00370
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00368	-0.00370	-0.00370

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)	0.00195	0.00196	0.00178
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00172	0.00174	0.00173
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00373	0.00373	0.00370
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00373	0.00373	0.00370

SKY130_OSU_SC_15T_MS__BUFx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__buf_1	0.00419	2.02431
sky130_osu_sc_15T_ms__buf_2	0.00423	3.96749
sky130_osu_sc_15T_ms__buf_4	0.00423	7.71044
sky130_osu_sc_15T_ms__buf_6	0.00091	1.80000
sky130_osu_sc_15T_ms__buf_8	0.00424	14.75073
sky130_osu_sc_15T_ms__buf_l	0.00323	1.25253

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__buf_1	**A->Y (RR)**	0.05363	0.53564	6.78196
sky130_osu_sc_15T_ms__buf_2	**A->Y (RR)**	0.06151	0.48172	6.78814
sky130_osu_sc_15T_ms__buf_4	**A->Y (RR)**	0.08339	0.48709	7.07292
sky130_osu_sc_15T_ms__buf_8	**A->Y (RR)**	0.12557	0.54387	7.38580
sky130_osu_sc_15T_ms__buf_l	**A->Y (RR)**	0.06129	0.61241	6.56032

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)**	0.05733	0.53282	6.41228
sky130_osu_sc_15T_ms__buf_2	**A->Y (FF)**	0.06728	0.51600	6.74089
sky130_osu_sc_15T_ms__buf_4	**A->Y (FF)**	0.09376	0.53949	7.06465
sky130_osu_sc_15T_ms__buf_8	**A->Y (FF)**	0.14885	0.61223	7.35749
sky130_osu_sc_15T_ms__buf_l	**A->Y (FF)**	0.06609	0.57558	5.87206

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	0.00406	0.00453	0.03447
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00827	0.00877	0.04175
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01776	0.01895	0.04292
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03771	0.03899	0.06250
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00303	0.00331	0.02197

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.01068	0.01249	0.04573
sky130_osu_sc_15T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01375	0.01553	0.04659
sky130_osu_sc_15T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.02133	0.02378	0.05441
sky130_osu_sc_15T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.03806	0.03996	0.07103
sky130_osu_sc_15T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00818	0.00910	0.03043

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
	-0.00073	-0.00073	-0.00071

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_15T_ms__buf_6	0.00000	0.00000	0.00000
	0.00073	0.00073	0.00071

SKY130_OSU_SC_15T_MS__DFFRx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffr_1	53.11350
sky130_osu_sc_15T_ms__dffr_l	53.11350

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_15T_ms__dffr_1	0.00398	0.00395	0.01169	1.86289	1.86108
sky130_osu_sc_15T_ms__dffr_l	0.00398	0.00395	0.01168	1.26621	1.25983

Leakage Information

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

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffr_1	CK->Q (RR)	0.28884	1.33408	15.50980
	QN->Q (FR)	0.03007	0.81675	12.54650
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RR)	0.28158	1.43555	15.00670
	QN->Q (FR)	0.03354	0.87684	12.24950

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)	0.27613	1.36023	16.30850
	QN->Q (RF)	0.02499	0.66575	10.17860
	RN->Q (FF)	0.20213	1.35683	17.13610
sky130_osu_sc_15T_ms__dffr_l	CK->Q (RF)	0.28140	1.49204	15.88480
	QN->Q (RF)	0.02556	0.66021	9.26978
	RN->Q (FF)	0.20781	1.48936	16.70380

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)	0.24322	0.75774	6.84952
	RN->QN (FR)	0.16916	0.75465	7.67606
sky130_osu_sc_15T_ms__dffr_l	CK->QN (RR)	0.24533	0.83127	6.96090
	RN->QN (FR)	0.17152	0.82846	7.78032

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)**	0.24826	0.69697	5.55241
sky130_osu_sc_15T_ms__dffr_l	**CK->QN (RF)**	0.23485	0.69570	5.03964

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)	-0.06725	-0.08074	-0.08399
	setup	CK (R)	0.23022	0.25977	0.83264
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06820	-0.08074	-0.08199
	setup	CK (R)	0.22978	0.26185	0.84399

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)	-0.10522	-0.30923	-2.73705
	setup	CK (R)	0.12885	0.32114	2.85178
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10316	-0.30810	-2.71699
	setup	CK (R)	0.12885	0.32114	2.85181

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)	-0.06725	-0.08074	-0.08399
	setup	CK (R)	0.23022	0.25977	0.83264
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.06820	-0.08074	-0.08199
	setup	CK (R)	0.22978	0.26185	0.84399

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)	-0.10522	-0.30923	-2.73705
	setup	CK (R)	0.12885	0.32114	2.85178
sky130_osu_sc_15T_ms__dffr_l	hold	CK (R)	-0.10316	-0.30810	-2.71699
	setup	CK (R)	0.12885	0.32114	2.85181

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)	0.19514	0.22552	1.06056
	removal	CK (R)	-0.04729	-0.05453	-0.14092
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.19658	0.22676	1.07761
	removal	CK (R)	-0.04481	-0.05479	-0.14097

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)	0.19514	0.22552	1.06056
	removal	CK (R)	-0.04729	-0.05453	-0.14092
sky130_osu_sc_15T_ms__dffr_l	recovery	CK (R)	0.19658	0.22676	1.07761
	removal	CK (R)	-0.04481	-0.05479	-0.14097

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 ()	0.11589	0.46875	13.33370
	min_pulse_width	RN ()	0.11589	0.46875	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	RN ()	0.11589	0.46875	13.33370
	min_pulse_width	RN ()	0.11589	0.46875	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 ()	0.13706	0.46875	13.33370
	min_pulse_width	CK ()	0.14412	0.46875	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.12648	0.46875	13.33370
	min_pulse_width	CK ()	0.14059	0.46875	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 ()	0.28526	0.46875	13.33370
	min_pulse_width	CK ()	0.10883	0.46875	13.33370
sky130_osu_sc_15T_ms__dffr_l	min_pulse_width	CK ()	0.28526	0.46875	13.33370
	min_pulse_width	CK ()	0.10530	0.46875	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	0.01088	0.00875	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00956	0.00822	0.01661

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	0.01231	0.00963	0.00000
	RN	-0.00141	-0.09253	-1.50894
	RN	0.02850	0.02631	0.00415
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01100	0.00952	0.00978
	RN	-0.00141	-0.07340	-1.02563
	RN	0.02718	0.02620	0.02734

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	0.01230	0.00969	0.00000
	RN	-0.00141	-0.09248	-1.50742
	RN	0.02849	0.02629	0.00447
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.01099	0.00952	0.00962
	RN	-0.00141	-0.07318	-1.02046
	RN	0.02717	0.02619	0.02722

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	0.01084	0.00869	0.00000
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00951	0.00820	0.01668

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	-0.00294	-0.00351	-0.00355
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01344	0.01293	0.03341
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00566	0.00526	0.02594
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00294	-0.00351	-0.00355
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01343	0.01293	0.03341
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00566	0.00526	0.02594

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	0.00354	0.00358	0.00357
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02174	0.02158	0.04341
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01048	0.01041	0.03186
sky130_osu_sc_15T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00354	0.00358	0.00357
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.02174	0.02158	0.04341
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.01048	0.01041	0.03186

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)	0.00392	0.00408	0.04217
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01194	0.01180	0.05018
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)	0.00391	0.00407	0.04217
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01194	0.01179	0.05017

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)	0.01040	0.01186	0.05102
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02156	0.02278	0.06190
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)	0.01040	0.01186	0.05101
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.02155	0.02277	0.06190

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)	-0.00092	-0.00080	0.03688
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00651	0.00572	0.04494
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00112	0.03629
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00092	-0.00080	0.03688
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00651	0.00572	0.04494
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00130	-0.00112	0.03629

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)	0.01584	0.01713	0.05658
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03393	0.03422	0.07947
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02569	0.02636	0.06584
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03311	0.03522	0.10185
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01783	0.01902	0.05770
sky130_osu_sc_15T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01583	0.01713	0.05658
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.03393	0.03422	0.07947
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.02569	0.02636	0.06583
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.03311	0.03522	0.10185
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01783	0.01897	0.05770

SKY130_OSU_SC_15T_MS__DFFSRx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffsr_1	57.99750
sky130_osu_sc_15T_ms__dffsr_l	57.99750

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	RN	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffsr_1	0.00393	0.00396	0.00874	0.01193	2.10152	2.09154
sky130_osu_sc_15T_ms__dffsr_l	0.00393	0.00396	0.00872	0.01193	1.25803	1.26103

Leakage Information

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

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffsr_1	CK->Q (RR)	0.28166	1.36135	16.79190
	QN->Q (FR)	0.02620	0.75916	12.00270
	RN->Q (RR)	0.22825	1.32261	16.82380
	SN->Q (FR)	0.20466	1.37548	17.87040
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RR)	0.28303	1.43777	14.92040
	QN->Q (FR)	0.03355	0.87281	12.17780
	RN->Q (RR)	0.23009	1.39930	14.94060
	SN->Q (FR)	0.20640	1.44840	15.97250

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)	0.31854	1.42678	17.45540
	QN->Q (RF)	0.02469	0.69500	10.97560
	RN->Q (FF)	0.20965	1.39367	18.27530
sky130_osu_sc_15T_ms__dffsr_l	CK->Q (RF)	0.32921	1.54045	15.83830
	QN->Q (RF)	0.02551	0.65812	9.22711
	RN->Q (FF)	0.22018	1.50650	16.65110

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)	0.28555	0.79687	7.04486
	RN->QN (FR)	0.17726	0.76365	7.86393
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RR)	0.29240	0.88427	7.02514
	RN->QN (FR)	0.18378	0.85094	7.83848

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)	0.24500	0.71987	6.21557
	RN->QN (RF)	0.19194	0.68122	6.25124
	SN->QN (FF)	0.16840	0.73430	7.28809
sky130_osu_sc_15T_ms__dffsr_l	CK->QN (RF)	0.23817	0.70288	5.05398
	RN->QN (RF)	0.18559	0.66511	5.08631
	SN->QN (FF)	0.16193	0.71393	6.11124

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)	-0.06860	-0.08810	-0.12582
	setup	CK (R)	0.21665	0.24819	0.88970
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06606	-0.08766	-0.12486
	setup	CK (R)	0.21612	0.24794	0.89432

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)	-0.12145	-0.32820	-2.81269
	setup	CK (R)	0.15554	0.33956	2.93897
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12392	-0.32907	-2.80731
	setup	CK (R)	0.15629	0.33956	2.93897

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)	-0.06860	-0.08810	-0.12582
	setup	CK (R)	0.21665	0.24819	0.88970
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.06606	-0.08766	-0.12486
	setup	CK (R)	0.21612	0.24794	0.89432

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)	-0.12145	-0.32820	-2.81269
	setup	CK (R)	0.15554	0.33956	2.93897
sky130_osu_sc_15T_ms__dffsr_l	hold	CK (R)	-0.12392	-0.32907	-2.80731
	setup	CK (R)	0.15629	0.33956	2.93897

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)	0.16369	0.19578	1.00764
	removal	CK (R)	-0.02385	-0.02870	-0.07934
	hold	SN (R)	-0.16263	-0.32147	-1.36207
	setup	SN (R)	0.18688	0.37155	4.68465
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.16273	0.19562	1.00740
	removal	CK (R)	-0.02385	-0.02870	-0.07934
	hold	SN (R)	-0.15641	-0.31313	-1.31299
	setup	SN (R)	0.18621	0.36171	4.61677

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)	0.16369	0.19578	1.00764
	removal	CK (R)	-0.02385	-0.02870	-0.07934
	hold	SN (R)	-0.16359	-0.32147	-1.36207
	hold	SN (R)	-0.16263	-0.32357	-1.36496
	setup	SN (R)	0.18688	0.36926	4.49567
	setup	SN (R)	0.18665	0.37155	4.68465
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.16273	0.19562	1.00740
	removal	CK (R)	-0.02385	-0.02870	-0.07934
	hold	SN (R)	-0.16021	-0.31313	-1.31299
	hold	SN (R)	-0.15641	-0.31320	-1.31894
	setup	SN (R)	0.18621	0.35809	4.39940
	setup	SN (R)	0.17595	0.36171	4.61677

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 ()	0.13706	0.46875	13.33370
	min_pulse_width	RN ()	0.13706	0.46875	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	RN ()	0.13706	0.46875	13.33370
	min_pulse_width	RN ()	0.13353	0.46875	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)	0.04300	0.07833	4.48992
	removal	CK (R)	-0.02023	-0.06266	-0.30755
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03957	0.07833	4.31856
	removal	CK (R)	-0.01758	-0.06266	-0.30647

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)	0.04300	0.07833	4.48992
	removal	CK (R)	-0.02023	-0.06266	-0.30755
sky130_osu_sc_15T_ms__dffsr_l	recovery	CK (R)	0.03957	0.07833	4.31856
	removal	CK (R)	-0.01758	-0.06266	-0.30647

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 ()	0.16176	0.46875	13.33370
	min_pulse_width	SN ()	0.16176	0.46875	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	SN ()	0.16176	0.46875	13.33370
	min_pulse_width	SN ()	0.15471	0.46875	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 ()	0.12648	0.46875	13.33370
	min_pulse_width	CK ()	0.16176	0.46875	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.12295	0.46875	13.33370
	min_pulse_width	CK ()	0.16176	0.46875	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 ()	0.27468	0.46875	13.33370
	min_pulse_width	CK ()	0.13706	0.46875	13.33370
sky130_osu_sc_15T_ms__dffsr_l	min_pulse_width	CK ()	0.27115	0.46875	13.33370
	min_pulse_width	CK ()	0.13706	0.46875	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	0.01367	0.01123	-0.00375
	RN	0.02499	0.02241	-0.00230
	SN	-0.00141	-0.09947	-1.70223
	SN	0.02781	0.02479	-0.00309
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01248	0.01114	0.01970
	RN	0.02379	0.02233	0.02251
	SN	-0.00141	-0.07312	-1.01901
	SN	0.02662	0.02469	0.02194

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	0.01437	0.01284	0.00375
	RN	-0.00141	-0.09947	-1.70222
	RN	0.02977	0.02852	0.02119
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01313	0.01178	0.01213
	RN	-0.00141	-0.07312	-1.01901
	RN	0.02849	0.02741	0.02923

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	0.01436	0.01282	0.00391
	RN	-0.00141	-0.09919	-1.69392
	RN	0.02974	0.02847	0.02104
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01313	0.01179	0.01197
	RN	-0.00141	-0.07322	-1.02143
	RN	0.02848	0.02741	0.02906

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	0.01362	0.01121	-0.00391
	RN	0.02493	0.02238	-0.00250
	SN	-0.00141	-0.09919	-1.69404
	SN	0.02776	0.02475	-0.00280
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.01243	0.01109	0.01928
	RN	0.02374	0.02229	0.02238
	SN	-0.00141	-0.07322	-1.02138
	SN	0.02657	0.02465	0.02183

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	-0.00349	-0.00354	-0.00355
	(!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)	0.01735	0.01686	0.03713
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00647	0.00608	0.02647
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00647	0.00609	0.02652
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00652	0.00614	0.02653
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00349	-0.00354	-0.00355
	(!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)	0.01735	0.01686	0.03713
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00647	0.00608	0.02647
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00647	0.00608	0.02652
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00652	0.00613	0.02653

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	0.00357	0.00356	0.00355
	(!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)	0.02510	0.02487	0.04606
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01115	0.01113	0.03236
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01128	0.01121	0.03236
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01110	0.01107	0.03230
sky130_osu_sc_15T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00357	0.00356	0.00355
	(!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)	0.02509	0.02486	0.04602
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.01114	0.01111	0.03235
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.01127	0.01120	0.03235
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.01108	0.01106	0.03229

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)	0.00345	0.00358	0.04133
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01461	0.01450	0.05277
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)	0.00345	0.00358	0.04134
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01461	0.01450	0.05278

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)	0.01119	0.01276	0.05202
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02281	0.02397	0.06333
sky130_osu_sc_15T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.01117	0.01274	0.05201
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.02279	0.02395	0.06332

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)	-0.00816	-0.00821	-0.00821
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00769	-0.00870	-0.00867
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00776	-0.00822	-0.00824
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00535	0.00503	0.02714
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)	-0.00816	-0.00821	-0.00822
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00767	-0.00868	-0.00865
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00775	-0.00822	-0.00823
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00536	0.00504	0.02715

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)	0.00821	0.00839	0.00825
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00864	0.00875	0.00870
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00822	0.00824	0.00827
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01791	0.01758	0.03846
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)	0.00821	0.00839	0.00825
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00862	0.00873	0.00867
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00821	0.00824	0.00826
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01790	0.01756	0.03845

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)	-0.00092	-0.00080	0.03688
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00750	0.00680	0.04591
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00732	0.00667	0.04583
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00109	-0.00097	0.03650
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00447	0.00470	0.07484
sky130_osu_sc_15T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00092	-0.00080	0.03688
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00749	0.00678	0.04590
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00731	0.00665	0.04581
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00109	-0.00097	0.03649
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00447	0.00470	0.07485

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)	0.03809	0.03845	0.08364
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01590	0.01722	0.05664
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02626	0.02701	0.06643
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02631	0.02707	0.06650
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03641	0.03821	0.10496
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01768	0.01886	0.05755
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02126	0.02350	0.09617
sky130_osu_sc_15T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.03809	0.03845	0.08364
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01590	0.01722	0.05664
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.02626	0.02701	0.06643
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.02630	0.02707	0.06652
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.03640	0.03820	0.10495
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01768	0.01886	0.05755
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.02125	0.02348	0.09616

SKY130_OSU_SC_15T_MS__DFFSx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dffs_1	48.22950
sky130_osu_sc_15T_ms__dffs_l	48.22950

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_15T_ms__dffs_1	0.00396	0.00691	0.01169	1.88706	1.86889
sky130_osu_sc_15T_ms__dffs_l	0.00396	0.00691	0.01169	1.27522	1.26658

Leakage Information

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

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dffs_1	CK->Q (RR)	0.22466	1.26241	15.57820
	QN->Q (FR)	0.03004	0.81787	12.57880
	SN->Q (FR)	0.17483	1.34998	16.81660
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RR)	0.22319	1.37087	15.00050
	QN->Q (FR)	0.03349	0.87533	12.25560
	SN->Q (FR)	0.17388	1.45096	16.21830

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)	0.30614	1.40056	16.50170
	QN->Q (RF)	0.02486	0.66557	10.21660
sky130_osu_sc_15T_ms__dffs_l	CK->Q (RF)	0.31019	1.52863	15.99240
	QN->Q (RF)	0.02546	0.65909	9.28030

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)	0.27203	0.79250	6.88575
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RR)	0.27314	0.86457	7.00927

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)	0.18764	0.62243	5.47524
	SN->QN (FF)	0.13764	0.70963	6.71721
sky130_osu_sc_15T_ms__dffs_l	CK->QN (RF)	0.18021	0.62972	4.97772
	SN->QN (FF)	0.13020	0.71055	6.18525

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)	-0.05141	-0.07044	-0.06816
	setup	CK (R)	0.16799	0.20566	0.86651
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05193	-0.07214	-0.06910
	setup	CK (R)	0.16771	0.20603	0.87821

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)	-0.10699	-0.31099	-2.57028
	setup	CK (R)	0.14327	0.32358	2.87128
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10979	-0.30760	-2.44322
	setup	CK (R)	0.14299	0.32358	2.87128

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)	-0.05141	-0.07044	-0.06816
	setup	CK (R)	0.16799	0.20566	0.86651
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.05193	-0.07214	-0.06910
	setup	CK (R)	0.16771	0.20603	0.87821

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)	-0.10699	-0.31099	-2.57028
	setup	CK (R)	0.14327	0.32358	2.87128
sky130_osu_sc_15T_ms__dffs_l	hold	CK (R)	-0.10979	-0.30760	-2.44322
	setup	CK (R)	0.14299	0.32358	2.87128

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)	0.04266	0.06979	3.21455
	removal	CK (R)	-0.01710	-0.05091	-0.14354
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04128	0.07154	3.05847
	removal	CK (R)	-0.01710	-0.05091	-0.14354

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)	0.04266	0.06979	3.21455
	removal	CK (R)	-0.01710	-0.05091	-0.14354
sky130_osu_sc_15T_ms__dffs_l	recovery	CK (R)	0.04128	0.07154	3.05847
	removal	CK (R)	-0.01710	-0.05091	-0.14354

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 ()	0.12295	0.46875	13.33370
	min_pulse_width	SN ()	0.12648	0.46875	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	SN ()	0.12295	0.46875	13.33370
	min_pulse_width	SN ()	0.11942	0.46875	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 ()	0.09825	0.46875	13.33370
	min_pulse_width	CK ()	0.15471	0.46875	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.09472	0.46875	13.33370
	min_pulse_width	CK ()	0.14765	0.46875	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 ()	0.22175	0.46875	13.33370
	min_pulse_width	CK ()	0.12295	0.46875	13.33370
sky130_osu_sc_15T_ms__dffs_l	min_pulse_width	CK ()	0.22175	0.46875	13.33370
	min_pulse_width	CK ()	0.12295	0.46875	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	0.01087	0.00872	0.00000
	SN	-0.00141	-0.09325	-1.52852
	SN	0.02342	0.02108	0.00261
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00955	0.00826	0.01576
	SN	-0.00141	-0.07371	-1.03293
	SN	0.02209	0.02060	0.02067

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	0.01223	0.00963	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01091	0.00950	0.01021

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	0.01222	0.00965	0.00000
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.01091	0.00951	0.01008

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	0.01083	0.00873	0.00000
	SN	-0.00141	-0.09271	-1.51370
	SN	0.02337	0.02105	0.00242
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00950	0.00820	0.01688
	SN	-0.00141	-0.07341	-1.02588
	SN	0.02204	0.02056	0.02071

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	-0.00355	-0.00361	-0.00360
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01293	0.01242	0.03334
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00553	0.00514	0.02578
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00355	-0.00361	-0.00360
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01293	0.01242	0.03334
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00553	0.00514	0.02578

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	0.00362	0.00361	0.00360
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02132	0.02106	0.04266
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01063	0.01062	0.03211
sky130_osu_sc_15T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00362	0.00361	0.00360
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.02131	0.02106	0.04266
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.01062	0.01062	0.03211

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)	-0.00587	-0.00591	-0.00589
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00443	0.00429	0.02581
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)	-0.00587	-0.00591	-0.00590
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00443	0.00429	0.02581

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)	0.00593	0.00596	0.00592
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01239	0.01250	0.03507
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)	0.00593	0.00596	0.00592
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.01239	0.01249	0.03507

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)	-0.00095	-0.00083	0.03689
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00125	-0.00108	0.03638
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00348	0.00380	0.07457
sky130_osu_sc_15T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00095	-0.00083	0.03689
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00125	-0.00108	0.03638
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00348	0.00380	0.07457

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)	0.03364	0.03394	0.07988
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01585	0.01715	0.05664
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03255	0.03443	0.10108
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01776	0.01894	0.05767
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02063	0.02294	0.09614
sky130_osu_sc_15T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.03363	0.03394	0.07988
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01585	0.01715	0.05663
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.03254	0.03443	0.10108
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01776	0.01894	0.05767
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.02063	0.02294	0.09614

SKY130_OSU_SC_15T_MS__DFFx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__dff_1	40.29300
sky130_osu_sc_15T_ms__dff_l	40.29300

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_15T_ms__dff_1	0.00412	0.01154	2.12054	2.11169
sky130_osu_sc_15T_ms__dff_l	0.00412	0.01152	1.13713	1.13587

Leakage Information

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

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->Q (RR)	0.18533	1.25084	16.75960
	QN->Q (FR)	0.02604	0.75908	12.02640
sky130_osu_sc_15T_ms__dff_l	CK->Q (RR)	0.19309	1.30889	13.88370
	QN->Q (FR)	0.03782	0.93355	12.66360

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)	0.26225	1.36734	17.50450
	QN->Q (RF)	0.02459	0.69522	11.00890
sky130_osu_sc_15T_ms__dff_l	CK->Q (RF)	0.27728	1.47072	15.01100
	QN->Q (RF)	0.02557	0.63642	8.71568

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__dff_1	CK->QN (RR)	0.23048	0.73524	7.02113
sky130_osu_sc_15T_ms__dff_l	CK->QN (RR)	0.24073	0.83639	6.82633

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)	0.15245	0.60904	6.11367
sky130_osu_sc_15T_ms__dff_l	CK->QN (RF)	0.15009	0.57589	4.43077

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)	-0.04387	-0.06450	-0.06899
	setup	CK (R)	0.12523	0.16995	0.90521
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.04574	-0.06450	-0.06865
	setup	CK (R)	0.12480	0.16845	0.90638

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)	-0.09937	-0.31061	-2.03079
	setup	CK (R)	0.12208	0.32247	2.89440
sky130_osu_sc_15T_ms__dff_l	hold	CK (R)	-0.09972	-0.31061	-2.03394
	setup	CK (R)	0.12120	0.32346	2.89417

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 ()	0.08413	0.46875	13.33370
	min_pulse_width	CK ()	0.14059	0.46875	13.33370
sky130_osu_sc_15T_ms__dff_l	min_pulse_width	CK ()	0.08060	0.46875	13.33370
	min_pulse_width	CK ()	0.13706	0.46875	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 ()**	0.18293	0.46875	13.33370
	min_pulse_width	**CK ()**	0.09825	0.46875	13.33370
sky130_osu_sc_15T_ms__dff_l	**min_pulse_width**	**CK ()**	0.18293	0.46875	13.33370
	min_pulse_width	**CK ()**	0.09825	0.46875	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	0.01150	0.00898	-0.00255
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01034	0.00910	0.01996

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	0.01245	0.01093	0.00255
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01120	0.00918	0.00270

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	0.01245	0.01092	0.00270
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01120	0.00919	0.00267

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	0.01146	0.00901	-0.00270
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.01029	0.00907	0.02013

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	-0.00294	-0.00350	-0.00354
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01209	0.01174	0.03285
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00294	-0.00350	-0.00354
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01210	0.01174	0.03286

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	0.00353	0.00357	0.00355
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02203	0.02185	0.04399
sky130_osu_sc_15T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00353	0.00357	0.00355
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.02203	0.02179	0.04400

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)	-0.00095	-0.00094	0.03693
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00123	-0.00105	0.03641
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00095	-0.00094	0.03693
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00123	-0.00105	0.03643

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)	0.01579	0.01707	0.05656
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03281	0.03325	0.07978
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03305	0.03497	0.10250
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01766	0.01886	0.05758
sky130_osu_sc_15T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01579	0.01707	0.05656
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.03282	0.03325	0.07976
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.03306	0.03498	0.10250
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01766	0.01886	0.05758

SKY130_OSU_SC_15T_MS__INVx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_15T_ms__inv_1	0.00400	1.97693
sky130_osu_sc_15T_ms__inv_10	0.03696	17.59312
sky130_osu_sc_15T_ms__inv_2	0.00758	3.85999
sky130_osu_sc_15T_ms__inv_3	0.01128	5.57316
sky130_osu_sc_15T_ms__inv_4	0.01490	7.49646
sky130_osu_sc_15T_ms__inv_6	0.02233	11.04239
sky130_osu_sc_15T_ms__inv_8	0.02965	14.48646
sky130_osu_sc_15T_ms__inv_l	0.00299	1.08849

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__inv_1	**A->Y (FR)**	0.02486	0.69703	10.81240
sky130_osu_sc_15T_ms__inv_10	**A->Y (FR)**	0.03592	0.46550	10.62280
sky130_osu_sc_15T_ms__inv_2	**A->Y (FR)**	0.02023	0.59706	10.66360
sky130_osu_sc_15T_ms__inv_3	**A->Y (FR)**	0.02240	0.56055	10.71000
sky130_osu_sc_15T_ms__inv_4	**A->Y (FR)**	0.02290	0.53155	10.68690
sky130_osu_sc_15T_ms__inv_6	**A->Y (FR)**	0.02614	0.49758	10.68310
sky130_osu_sc_15T_ms__inv_8	**A->Y (FR)**	0.03070	0.47691	10.65980
sky130_osu_sc_15T_ms__inv_l	**A->Y (FR)**	0.03268	0.79204	10.64460

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)**	0.02194	0.60178	9.34842
sky130_osu_sc_15T_ms__inv_10	**A->Y (RF)**	0.03271	0.38515	9.17383
sky130_osu_sc_15T_ms__inv_2	**A->Y (RF)**	0.01806	0.51465	9.26319
sky130_osu_sc_15T_ms__inv_3	**A->Y (RF)**	0.01990	0.48502	9.37324
sky130_osu_sc_15T_ms__inv_4	**A->Y (RF)**	0.01988	0.45449	9.35303
sky130_osu_sc_15T_ms__inv_6	**A->Y (RF)**	0.02431	0.42100	9.34838
sky130_osu_sc_15T_ms__inv_8	**A->Y (RF)**	0.02846	0.40174	9.31033
sky130_osu_sc_15T_ms__inv_l	**A->Y (RF)**	0.02343	0.57220	7.77425

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00560	0.00617	0.01152
sky130_osu_sc_15T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.04772	0.05726	0.11103
sky130_osu_sc_15T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00987	0.01132	0.02205
sky130_osu_sc_15T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01517	0.01770	0.03338
sky130_osu_sc_15T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01943	0.02266	0.04379
sky130_osu_sc_15T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02885	0.03519	0.06576
sky130_osu_sc_15T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.03822	0.04622	0.08810
sky130_osu_sc_15T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00417	0.00445	0.00848

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	-0.00124	-0.00104	0.00117
sky130_osu_sc_15T_ms__inv_10	**A**	0.00000	0.00000	0.00000
	A	-0.01922	-0.01554	0.00868
sky130_osu_sc_15T_ms__inv_2	**A**	0.00000	0.00000	0.00000
	A	-0.00382	-0.00306	0.00133
sky130_osu_sc_15T_ms__inv_3	**A**	0.00000	0.00000	0.00000
	A	-0.00510	-0.00424	0.00272
sky130_osu_sc_15T_ms__inv_4	**A**	0.00000	0.00000	0.00000
	A	-0.00777	-0.00580	0.00287
sky130_osu_sc_15T_ms__inv_6	**A**	0.00000	0.00000	0.00000
	A	-0.01182	-0.00927	0.00447
sky130_osu_sc_15T_ms__inv_8	**A**	0.00000	0.00000	0.00000
	A	-0.01581	-0.01289	0.00633
sky130_osu_sc_15T_ms__inv_l	**A**	0.00000	0.00000	0.00000
	A	-0.00076	-0.00064	0.00149

SKY130_OSU_SC_15T_MS__MUX2

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__mux2_1	15.26250

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	S0	Y
sky130_osu_sc_15T_ms__mux2_1	0.55248	0.55298	0.00818	0.57794

Leakage Information

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

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__mux2_1	A0->Y (RR)	-	0.01357	0.29366	3.37968
	A1->Y (RR)	-	0.01490	0.29548	3.38305
	S0->Y (RR)	(!A0 * A1)	0.04585	0.30616	1.99641
	S0->Y (FR)	(A0 * !A1)	0.03227	0.39029	3.81837

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)	-	0.01357	0.29564	3.36650
	A1->Y (FF)	-	0.01283	0.29342	3.35892
	S0->Y (FF)	(!A0 * A1)	0.05563	0.36046	2.64592
	S0->Y (RF)	(A0 * !A1)	0.02513	0.33857	3.23279

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	-	-0.00565	-0.00567	-0.00566
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00381	-0.00380	-0.00381
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00692	0.00851	0.04921
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00390	-0.00311	0.03579

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	-	0.00565	0.00567	0.00567
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00381	0.00382	0.00382
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00096	0.00160	0.04140
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01513	0.01656	0.05643

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

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

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

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

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

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

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

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

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00150	-0.00070	0.03851
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00145	-0.00096	0.03870

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.01153	0.01306	0.05296
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.01052	0.01225	0.05255

SKY130_OSU_SC_15T_MS__NAND2x

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nand2_1	7.93650
sky130_osu_sc_15T_ms__nand2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nand2_1	0.00400	0.00398	1.67394
sky130_osu_sc_15T_ms__nand2_l	0.00299	0.00298	1.08393

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nand2_1	A->Y (FR)	0.02563	0.66409	9.86970
	B->Y (FR)	0.03035	0.65909	9.71685
sky130_osu_sc_15T_ms__nand2_l	A->Y (FR)	0.03352	0.79361	10.65400
	B->Y (FR)	0.04033	0.79887	10.62860

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)	0.03137	0.71790	10.72400
	B->Y (RF)	0.03593	0.69935	10.33980
sky130_osu_sc_15T_ms__nand2_l	A->Y (RF)	0.03381	0.73185	9.75390
	B->Y (RF)	0.03784	0.71017	9.31504

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00595	0.00652	0.01175
	B	0.00000	0.00000	0.00000
	B	0.00758	0.00795	0.01332
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00439	0.00468	0.00820
	B	0.00000	0.00000	0.00000
	B	0.00554	0.00570	0.00934

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	-0.00087	-0.00080	0.00140
	B	0.00000	0.00000	0.00000
	B	-0.00082	-0.00089	0.00083
sky130_osu_sc_15T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00045	0.00139
	B	0.00000	0.00000	0.00000
	B	-0.00052	-0.00057	0.00091

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)	-0.00403	-0.00404	-0.00406
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00278	-0.00279	-0.00280

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00405	0.00414	0.00407
sky130_osu_sc_15T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00279	0.00286	0.00281

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00374	-0.00376	-0.00375
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00259	-0.00261	-0.00259

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)	0.00378	0.00380	0.00376
sky130_osu_sc_15T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00262	0.00262	0.00260

SKY130_OSU_SC_15T_MS__NOR2x

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__nor2_1	7.93650
sky130_osu_sc_15T_ms__nor2_l	7.93650

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__nor2_1	0.00398	0.00426	1.05244
sky130_osu_sc_15T_ms__nor2_l	0.00289	0.00321	0.64178

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__nor2_1	A->Y (FR)	0.05300	0.80930	10.42220
	B->Y (FR)	0.04058	0.80343	10.60310
sky130_osu_sc_15T_ms__nor2_l	A->Y (FR)	0.06397	0.91723	10.30980
	B->Y (FR)	0.05292	0.91767	10.60320

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)	0.03025	0.50464	6.60107
	B->Y (RF)	0.02347	0.49280	6.58356
sky130_osu_sc_15T_ms__nor2_l	A->Y (RF)	0.02982	0.49298	5.77002
	B->Y (RF)	0.02479	0.48403	5.75522

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	0.00803	0.00797	0.01131
	B	0.00000	0.00000	0.00000
	B	0.00613	0.00614	0.01385
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00567	0.00562	0.00839
	B	0.00000	0.00000	0.00000
	B	0.00449	0.00446	0.00966

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	0.00086	0.00082	0.00392
	B	0.00000	0.00000	0.00000
	B	-0.00097	-0.00075	0.00235
sky130_osu_sc_15T_ms__nor2_l	A	0.00000	0.00000	0.00000
	A	0.00052	0.00055	0.00337
	B	0.00000	0.00000	0.00000
	B	-0.00055	-0.00040	0.00239

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)	-0.00297	-0.00356	-0.00357
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00202	-0.00235	-0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00354	0.00358	0.00357
sky130_osu_sc_15T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00235	0.00237	0.00236

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00172	-0.00176	-0.00172
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00112	-0.00114	-0.00112

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00179	0.00182	0.00175
sky130_osu_sc_15T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00118	0.00118	0.00114

SKY130_OSU_SC_15T_MS__OAI21

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai21_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_15T_ms__oai21_l	0.00400	0.00409	0.00339	0.99821

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai21_l	A0->Y (FR)	0.05718	0.82126	10.46940
	A1->Y (FR)	0.07305	0.83072	10.30670
	B0->Y (FR)	0.03952	0.74027	9.69681

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)	0.04397	0.60137	7.59455
	A1->Y (RF)	0.05266	0.59396	7.39187
	B0->Y (RF)	0.03402	0.63577	8.29599

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	0.00845	0.00877	0.01508
	A1	0.00000	0.00000	0.00000
	A1	0.01036	0.01022	0.01340
	B0	0.00685	0.00702	0.01148

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00014	0.00003	0.00222
	A1	0.00000	0.00000	0.00000
	A1	0.00195	0.00164	0.00387
	B0	0.00074	0.00076	0.00313

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00173	-0.00176	-0.00173
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00354	-0.00361	-0.00359
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00364	-0.00366	-0.00365

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)	0.00181	0.00183	0.00175
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00358	0.00361	0.00359
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00364	0.00368	0.00366

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)	-0.00288	-0.00350	-0.00349
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00349	-0.00356	-0.00355
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00359	-0.00362	-0.00360

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00347	0.00350	0.00350
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00353	0.00356	0.00355
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00359	0.00364	0.00361

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)	-0.00286	-0.00287	-0.00291

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00291	0.00293	0.00293

SKY130_OSU_SC_15T_MS__OAI22

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__oai22_1	12.82050

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_15T_ms__oai22_1	0.00388	0.00410	0.00422	0.00413	1.04329

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__oai22_l	A0->Y (FR)	0.07913	0.83549	10.40710
	A1->Y (FR)	0.06655	0.82984	10.58880
	B0->Y (FR)	0.04574	0.81005	10.57980
	B1->Y (FR)	0.05929	0.81624	10.40200

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)	0.07518	0.65221	7.89874
	A1->Y (RF)	0.06015	0.63151	7.83142
	B0->Y (RF)	0.05082	0.66132	8.52934
	B1->Y (RF)	0.06652	0.68722	8.63468

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	0.01346	0.01333	0.01628
	A1	0.01151	0.01169	0.01814
	B0	0.00644	0.00677	0.01351
	B1	0.01046	0.01036	0.01331

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	A0	0.00329	0.00299	0.00506
	A1	-0.00038	-0.00049	0.00167
	B0	-0.00043	-0.00030	0.00259
	B1	0.00133	0.00123	0.00401

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)	-0.00296	-0.00356	-0.00357
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00295	-0.00356	-0.00357
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00352	-0.00356	-0.00356
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00360	-0.00362	-0.00361

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00354	0.00358	0.00357
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00354	0.00358	0.00357
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00354	0.00358	0.00356
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00360	0.00363	0.00362

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00170	-0.00174	-0.00171
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00170	-0.00174	-0.00171
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00348	-0.00355	-0.00353
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00358	-0.00358	-0.00359

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)	0.00179	0.00181	0.00173
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00179	0.00181	0.00173
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00352	0.00355	0.00353
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00358	0.00360	0.00359

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00169	-0.00173	-0.00170
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00169	-0.00173	-0.00169
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00391	-0.00398	-0.00395
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00391	-0.00394	-0.00399

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00177	0.00179	0.00172
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00177	0.00178	0.00172
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00394	0.00398	0.00395
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00399	0.00401	0.00401

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)	-0.00290	-0.00350	-0.00350
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00290	-0.00350	-0.00350
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00399	-0.00407	-0.00404
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00399	-0.00400	-0.00407

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00348	0.00351	0.00351
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00348	0.00351	0.00351
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00403	0.00407	0.00404
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00407	0.00409	0.00409

SKY130_OSU_SC_15T_MS__OR2x

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

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

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__or2_1	0.00434	0.00410	2.02743
sky130_osu_sc_15T_ms__or2_2	0.00434	0.00410	3.94754
sky130_osu_sc_15T_ms__or2_4	0.00434	0.00410	7.58252
sky130_osu_sc_15T_ms__or2_8	0.00434	0.00411	14.54686
sky130_osu_sc_15T_ms__or2_l	0.00330	0.00304	1.13157

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__or2_1	A->Y (RR)	0.06597	0.57569	6.78992
	B->Y (RR)	0.05712	0.54462	6.73417
sky130_osu_sc_15T_ms__or2_2	A->Y (RR)	0.07286	0.51295	6.77757
	B->Y (RR)	0.06369	0.48653	6.71851
sky130_osu_sc_15T_ms__or2_4	A->Y (RR)	0.09506	0.51262	7.01245
	B->Y (RR)	0.08574	0.49088	6.95511
sky130_osu_sc_15T_ms__or2_8	A->Y (RR)	0.13719	0.56422	7.41243
	B->Y (RR)	0.12785	0.54823	7.34788
sky130_osu_sc_15T_ms__or2_l	A->Y (RR)	0.07274	0.65948	6.46244
	B->Y (RR)	0.06462	0.63173	6.37147

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)	0.10359	0.62697	6.92989
	B->Y (FF)	0.08662	0.60459	6.96303
sky130_osu_sc_15T_ms__or2_2	A->Y (FF)	0.12254	0.60049	7.02601
	B->Y (FF)	0.10573	0.58676	7.01957
sky130_osu_sc_15T_ms__or2_4	A->Y (FF)	0.17200	0.64027	7.35721
	B->Y (FF)	0.15527	0.63492	7.32564
sky130_osu_sc_15T_ms__or2_8	A->Y (FF)	0.27372	0.75182	7.71987
	B->Y (FF)	0.25700	0.75205	7.68563
sky130_osu_sc_15T_ms__or2_l	A->Y (FF)	0.12103	0.63587	5.71018
	B->Y (FF)	0.10207	0.62249	5.75226

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	0.00610	0.00590	0.02744
	B	0.00000	0.00000	0.00000
	B	0.00444	0.00493	0.02923
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01041	0.01040	0.02886
	B	0.00000	0.00000	0.00000
	B	0.00866	0.00951	0.03311
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01993	0.02038	0.03867
	B	0.00000	0.00000	0.00000
	B	0.01812	0.01954	0.04232
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04010	0.04082	0.06022
	B	0.00000	0.00000	0.00000
	B	0.03819	0.04031	0.06424
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00437	0.00427	0.01702
	B	0.00000	0.00000	0.00000
	B	0.00332	0.00368	0.01856

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.01317	0.01318	0.03080
	B	0.00000	0.00000	0.00000
	B	0.01092	0.01263	0.04568
sky130_osu_sc_15T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01619	0.01664	0.03425
	B	0.00000	0.00000	0.00000
	B	0.01394	0.01594	0.04786
sky130_osu_sc_15T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.02432	0.02512	0.04217
	B	0.00000	0.00000	0.00000
	B	0.02208	0.02414	0.05415
sky130_osu_sc_15T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.04455	0.04131	0.05838
	B	0.00000	0.00000	0.00000
	B	0.04232	0.04016	0.06878
sky130_osu_sc_15T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00972	0.00949	0.02251
	B	0.00000	0.00000	0.00000
	B	0.00816	0.00907	0.02975

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)	-0.00298	-0.00360	-0.00359
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00298	-0.00360	-0.00359
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00298	-0.00360	-0.00359
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00296	-0.00360	-0.00359
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00203	-0.00241	-0.00239

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00360	0.00359
sky130_osu_sc_15T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00356	0.00360	0.00359
sky130_osu_sc_15T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00357	0.00360	0.00359
sky130_osu_sc_15T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00357	0.00360	0.00359
sky130_osu_sc_15T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00237	0.00241	0.00239

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00173	-0.00176	-0.00173
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00173	-0.00176	-0.00173
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00172	-0.00176	-0.00173
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00172	-0.00177	-0.00173
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00115	-0.00116	-0.00115

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00182	0.00183	0.00175
sky130_osu_sc_15T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00182	0.00183	0.00175
sky130_osu_sc_15T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00182	0.00183	0.00176
sky130_osu_sc_15T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00182	0.00184	0.00176
sky130_osu_sc_15T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00120	0.00122	0.00117

SKY130_OSU_SC_15T_MS__TBUFIx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tbufi_1	10.37850
sky130_osu_sc_15T_ms__tbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tbufi_1	0.00425	0.00546	1.05884
sky130_osu_sc_15T_ms__tbufi_l	0.00321	0.00417	0.64106

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (FR)	0.03849	0.80023	10.57840
	OE->Y (FR)	0.04279	0.35032	5.09365
	OE->Y (RR)	0.07298	0.65767	6.83809
sky130_osu_sc_15T_ms__tbufi_l	A->Y (FR)	0.05090	0.91635	10.59830
	OE->Y (FR)	0.04905	0.35015	5.09335
	OE->Y (RR)	0.08278	0.75895	6.55634

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tbufi_1	A->Y (RF)	0.03074	0.60737	8.09479
	OE->Y (FF)	0.04315	0.35034	5.09356
	OE->Y (RF)	0.02995	0.58327	7.66013
sky130_osu_sc_15T_ms__tbufi_l	A->Y (RF)	0.03360	0.60271	7.12560
	OE->Y (FF)	0.04974	0.35014	5.09335
	OE->Y (RF)	0.03195	0.57331	6.62813

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	0.00573	0.00610	0.01250
	OE	0.00000	0.00000	0.00000
	OE	0.00562	0.00619	0.04169
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00422	0.00417	0.00878
	OE	0.00000	0.00000	0.00000
	OE	0.00395	0.00435	0.02702

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	-0.00097	-0.00080	0.00197
	OE	0.00000	0.00000	0.00000
	OE	0.00357	0.00421	0.04384
sky130_osu_sc_15T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00044	0.00201
	OE	0.00000	0.00000	0.00000
	OE	0.00241	0.00286	0.02942

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00284	-0.00289	-0.00285
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00252	-0.00254	-0.00252
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00203	-0.00205	-0.00204
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00181	-0.00183	-0.00181

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00284	0.00289	0.00285
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00257	0.00260	0.00254
sky130_osu_sc_15T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00203	0.00205	0.00204
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00185	0.00186	0.00182

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)	0.00213	0.00285	0.04323
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00188	0.00262	0.04292
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00140	0.00189	0.02871
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00124	0.00174	0.02852

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)	0.00680	0.00819	0.04876
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00679	0.00825	0.04886
sky130_osu_sc_15T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00515	0.00593	0.03268
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00520	0.00601	0.03277

SKY130_OSU_SC_15T_MS__TNBUFIx

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__tnbufi_1	10.37850
sky130_osu_sc_15T_ms__tnbufi_l	10.37850

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_15T_ms__tnbufi_1	0.00424	0.00651	1.05889
sky130_osu_sc_15T_ms__tnbufi_l	0.00320	0.00468	0.64117

Leakage Information

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

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_15T_ms__tnbufi_1	A->Y (FR)	0.03883	0.80021	10.57870
	OE->Y (RR)	0.02830	0.35091	5.09421
	OE->Y (FR)	0.04949	0.80316	10.38240
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (FR)	0.05125	0.91630	10.59930
	OE->Y (RR)	0.02822	0.35083	5.09404
	OE->Y (FR)	0.06083	0.91538	10.28930

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)	0.03024	0.60719	8.09490
	OE->Y (RF)	0.02800	0.35090	5.09400
	OE->Y (FF)	0.05193	0.51246	5.37359
sky130_osu_sc_15T_ms__tnbufi_l	A->Y (RF)	0.03297	0.60248	7.12645
	OE->Y (RF)	0.02804	0.35083	5.09406
	OE->Y (FF)	0.05939	0.53806	4.77506

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00589	0.00626	0.01266
	OE	0.00000	0.00000	0.00000
	OE	0.01433	0.01625	0.05759
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00439	0.00433	0.00895
	OE	0.00000	0.00000	0.00000
	OE	0.01029	0.01147	0.03860

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	-0.00119	-0.00101	0.00176
	OE	0.00000	0.00000	0.00000
	OE	0.01251	0.01480	0.04987
sky130_osu_sc_15T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00076	-0.00065	0.00181
	OE	0.00000	0.00000	0.00000
	OE	0.00891	0.01030	0.03428

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00241	-0.00245	-0.00242
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00212	-0.00213	-0.00212
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00163	-0.00164	-0.00163
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00143	-0.00143	-0.00142

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00241	0.00245	0.00242
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00216	0.00219	0.00214
sky130_osu_sc_15T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00163	0.00164	0.00163
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00145	0.00146	0.00143

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)	-0.00416	-0.00377	0.03722
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00420	-0.00365	0.03724
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00268	-0.00243	0.02477
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00267	-0.00230	0.02480

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

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_15T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.01082	0.01308	0.05436
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.01066	0.01314	0.05421
sky130_osu_sc_15T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00773	0.00906	0.03627
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00762	0.00909	0.03621

SKY130_OSU_SC_15T_MS__XNOR2

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xnor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xnor2_l	0.00842	0.00751	1.10160

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_15T_ms__xnor2_l	0.00000	0.29373	0.51245

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (RR)	B	0.09178	0.69983	7.11851
	A->Y (FR)	!B	0.05133	0.82195	10.78390
	B->Y (RR)	A	0.07393	0.68153	7.16636
	B->Y (FR)	!A	0.06883	0.82968	10.61500

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xnor2_1	A->Y (FF)	B	0.09011	0.59391	5.77220
	A->Y (RF)	!B	0.04267	0.60190	7.85856
	B->Y (FF)	A	0.07749	0.58242	5.77221
	B->Y (RF)	!A	0.05380	0.61516	7.86265

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	0.00566	0.00599	0.03992
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01424	0.01582	0.06263
	B	A	0.00000	0.00000	0.00000
	B	A	0.00199	0.00286	0.04298
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01548	0.01691	0.05975

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	0.01739	0.01823	0.05798
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00365	0.00406	0.04534
	B	A	0.00000	0.00000	0.00000
	B	A	0.01564	0.01740	0.05839
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00497	0.00527	0.04633

SKY130_OSU_SC_15T_MS__XOR2

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
Temp 25.00

Truth Table

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

Footprint

Cell Name	Area
sky130_osu_sc_15T_ms__xor2_l	17.70450

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_15T_ms__xor2_l	0.00845	0.00756	1.05273

Leakage Information

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

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_15T_ms__xor2_l	A->Y (RR)	!B	0.09137	0.68677	6.97552
	A->Y (FR)	B	0.06394	0.81951	10.45510
	B->Y (RR)	!A	0.07790	0.68126	6.99064
	B->Y (FR)	A	0.07038	0.82568	10.44010

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	0.08029	0.57801	5.48985
	A->Y (RF)	B	0.04450	0.62691	8.07825
	B->Y (FF)	!A	0.07530	0.57439	5.58431
	B->Y (RF)	A	0.05327	0.60760	7.65681

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	0.01666	0.01816	0.06148
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00301	0.00261	0.04131
	B	A	0.00000	0.00000	0.00000
	B	A	0.01710	0.01863	0.06101
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00182	0.00248	0.04232

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	0.00319	0.00339	0.04556
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01779	0.01935	0.05430
	B	A	0.00000	0.00000	0.00000
	B	A	0.00323	0.00340	0.04411
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01590	0.01775	0.05840

SKY130_OSU_SC_15T_MS_x

sky130_osu_sc_15T_ms_tt_1P80_25C.ccs
Cell Library: Process , Voltage 1.80,
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	0.62573
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	279301.00000	558602.00000
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
	-0.00184	0.07242	1.03142

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
	4.86102	4.61989	1.24500