# TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Library

Cell Groups
TMRDFFQNX1
TMRDFFQX1
TMRDFFRNQNX1
TMRDFFRNQX1
TMRDFFSNQNX1
TMRDFFSNQX1
TMRDFFSNRNQNX1
TMRDFFSNRNQX1

# TMRDFFQNX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

IN	NPUT	OUTPUT
D	CLK	QN
0	R	1
1	R	0
X	x	IQN

## **Footprint**

Cell Name	Area
TMRDFFQNX1	550.33801

## **Pin Capacitance Information**

Call Name	Pin C	ap(pf)	Max Cap(pf)
Cell Name	D	CLK	QN
TMRDFFQNX1	0.03880	0.07289	3.19295

### **Leakage Information**

Call Nama	Leakage(nW)			
Cell Name	Min.	Avg	Max.	
TMRDFFQNX1	0.00000	80.34340	116.88600	

# **Delay Information** Delay(ns) to QN rising:

Call Name	Name Timing Ang(Din)		Delay(ns)	
Cell Name	Timing Arc(Dir)	First	Mid	Last
TMRDFFQNX1	CLK->QN (RR)	0.48919	1.71462	7.70903

### Delay(ns) to QN falling:

Call Name	Call Name Timing Ara(Dir)		Delay(ns)		
Cell Name	Timing Arc(Dir)	First	Mid	Last	
TMRDFFQNX1	CLK->QN (RF)	0.29802	0.72809	2.17277	

### **Constraint Information**

**Constraints(ns) for D rising:** 

Call Name	Timin a Chaole				ate(ns)
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFQNX1	hold	CLK (R)	0.06737	0.10366	0.57852
	setup	CLK (R)	0.13351	0.27512	0.72763

### **Constraints(ns) for D falling:**

Call Name	Timing Chook	Siming Cheek Dof Din(trans)		ence Slew Ra	ate(ns)
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFQNX1	hold	CLK (R)	-0.07316	-0.18833	-0.72346
	setup	CLK (R)	0.09176	0.26588	1.32910

### **Constraints(ns) for CLK rising (conditional):**

Cell Name	Timing Check	Dof Din(trong)	s) When	Refere	nce Slew I	Rate(ns)
Cell Name	Tilling Check	Ref Pin(trans)   Who	vvnen	first	mid	last
TMDDEEONY1	min_pulse_width	CLK ()	D	0.42969	2.66235	16.50020
TMRDFFQNX1	min_pulse_width	CLK ()	!D	0.42969	2.66235	16.50020

### $Constraints (ns) \ for \ CLK \ falling \ (conditional):$

Call Name	The Charles Def Physics		Timing Chook	Dof Din(tuons)	Dof Din(tuons)	Dof Din(tuons)	When	Refere	nce Slew I	Rate(ns)
Cell Name	Timing Check	Ref Pin(trans)	When	first	mid	last				
TMDDEEONY1	min_pulse_width	CLK ()	D	0.42969	2.66235	16.50020				
TMRDFFQNX1	min_pulse_width	CLK ()	!D	0.42969	2.66235	16.50020				

### **Power Information**

Internal switching power(pJ) to QN rising:

Call Name	Innut	Power(pJ)			
Cell Name	Input	first	mid	last	
TMDDEEONV1	CLK	0.00000	0.00000	0.00000	
TMRDFFQNX1	CLK	74.71440	74.82220	75.38450	

### Internal switching power(pJ) to QN falling:

Call Name	Immut	Power(pJ)					
Cell Name	Input	first	mid	last 0.00000			
TMDDEEONV1	CLK	0.00000	0.00000	0.00000			
TMRDFFQNX1	CLK	63.43050	63.53300	64.05900			

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

Cell Name	When				
	vvnen	first	mid	last 0.00000 70.27230 0.00000 74.93980 0.00000	
	(CLK * QN)	0.00000	0.00000	0.00000	
	(CLK * QN)	70.26690	70.26920	70.27230	
TMDDEEONV1	(CLK * !QN)	0.00000	0.00000	0.00000	
TMRDFFQNX1	(CLK * !QN)	74.51000	74.58340	74.93980	
	!CLK	0.00000	0.00000	0.00000	
	!CLK	31.61860	31.73220	32.24860	

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

Cell Name	When			
	When	first	mid	last
	(CLK * QN)	0.00000	0.00000	0.00000
	(CLK * QN)	72.12790	72.13110	72.13090
TMDDEEONV1	(CLK * !QN)	0.00000	0.00000	0.00000
TMRDFFQNX1	(CLK * !QN)	50.49850	50.58190	50.94180
	!CLK	0.00000	0.00000	0.00000
	!CLK	31.67580	31.79500	32.32670

### Passive power(pJ) for CLK rising (conditional):

Cell Name	W/h or	Power(pJ)				
	When	first	mid last			
TMRDFFQNX1	(D * !QN)	0.00000	0.00000	0.00000		
	(D * !QN)	63.64350	63.74430	64.26290		
	(!D * QN)	0.00000	0.00000	0.00000		
	(!D * QN)	74.28820	74.37520	74.88090		

### Passive power(pJ) for CLK falling (conditional):

Cell Name	When		Power(pJ)	
Cen Name	vvnen	first	mid	last
	(D * QN)	0.00000	0.00000	0.00000
	(D * QN)	29.43560	29.54430	30.06140
	(D * !QN)	0.00000	0.00000	0.00000
TMDDEEONV1	(D * !QN)	36.52960	36.64430	37.17810
TMRDFFQNX1	(!D * QN)	0.00000	0.00000	0.00000
	(!D * QN)	29.76450	29.88680	30.40070
	(!D * !QN)	0.00000	0.00000	0.00000
	(!D * !QN)	35.01320	35.14440	35.66280

# TMRDFFQX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process , Voltage 1.80, Temp 25.00

### **Truth Table**

IN	NPUT	OUTPUT
D	CLK	Q
0	R	0
1	R	1
x	X	IQ

# **Footprint**

Cell Name	Area	
TMRDFFQX1	566.76599	

# **Pin Capacitance Information**

Call Name	Pin C	Pin Cap(pf) Max Cap(pf		
Cell Name	D	CLK	Q	
TMRDFFQX1	0.03879	0.07298	5.23943	

# **Leakage Information**

Call Name	Leakage(nW)				
Cell Name	Min.	Avg	Max.		
TMRDFFQX1	0.00000	83.30790	123.69400		

# **Delay Information** Delay(ns) to Q rising:

Call Name	Timing Aug(Din)	Delay(ns)				
Cell Name	Timing Arc(Dir)	First	Mid	Last		
TMRDFFQX1	CLK->Q (RR)	0.35605	1.35745	7.12728		

### Delay(ns) to Q falling:

Call Name	Timing Aug(Din)	Delay(ns)		
Cell Name	Timing Arc(Dir)	First	Mid	Last
TMRDFFQX1	CLK->Q (RF)	0.50488	1.27258	5.47985

### **Constraint Information**

**Constraints(ns) for D rising:** 

Cell Name	Timing Chook	Ref Pin(trans)	Refere	ence Slew Ra	ate(ns)
	Timing Check	Kei Fin(trans)	first	mid	last
TMRDFFQX1	hold	CLK (R)	0.06418	0.10337	0.56960
	setup	CLK (R)	0.11743	0.25909	0.71176

### **Constraints(ns) for D falling:**

Call Name	Timin a Chaole	Dof Div(tuona)	Refer	Reference Slew Rate(ns)			
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last		
TMRDFFQX1	hold	CLK (R)	-0.07155	-0.18633	-0.71005		
	setup	CLK (R)	0.09301	0.26588	1.33184		

### **Constraints(ns) for CLK rising (conditional):**

Cell Name Timing Check Ref Pin(trans)		When	Reference Slew Rate(ns)			
Cell Name	Timing Check	Kei Fill(trails)	when	first	mid	last
TMRDFFQX1	min_pulse_width	CLK ()	D	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	!D	0.42969	2.66235	16.50020

### $Constraints (ns) \ for \ CLK \ falling \ (conditional):$

Call Name	Timing Cheek	Ref Pin(trans) When		Reference Slew Rate(ns)		
Cell Name	Name Timing Check Ref Pin(trans)		vviien	first	mid	last
TMRDFFQX1	min_pulse_width	CLK ()	D	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	!D	0.42969	2.66235	16.50020

### **Power Information**

Internal switching power(pJ) to Q rising:

Call Name	T4	Power(pJ)			
Cell Name	Input	first	mid	last	
TMRDFFQX1	CLK	0.00000	0.00000	0.00000	
	CLK	62.84200	62.94480	63.48180	

### Internal switching power(pJ) to Q falling:

Call Name	T4	Power(pJ)			
Cell Name	Input	first	mid	last	
TMRDFFQX1	CLK	0.00000	0.00000	0.00000	
	CLK	78.99270	79.09290	79.61690	

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

Cell Name	XX/1	Power(pJ)			
	When	first	mid	last	
	(CLK * Q)	0.00000	0.00000	0.00000	
	(CLK * Q)	73.77370	73.84700	74.20280	
TMDDEEOV1	(CLK * !Q)	0.00000	0.00000	0.00000	
TMRDFFQX1	(CLK * !Q)	74.45940	74.46240	74.46520	
	!CLK	0.00000	0.00000	0.00000	
	!CLK	35.23420	35.34810	35.86470	

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

Cell Name	Whom	Power(pJ)			
Cen Name	When	first	mid	last	
	(CLK * Q)	0.00000	0.00000	0.00000	
	(CLK * Q)	50.03550	50.11950	50.47920	
TEMP DEFOYA	(CLK * !Q)	0.00000	0.00000	0.00000	
TMRDFFQX1	(CLK * !Q)	76.32730	76.33010	76.33020	
	!CLK	0.00000	0.00000	0.00000	
	!CLK	35.29170	35.41180	35.94400	

### Passive power(pJ) for CLK rising (conditional):

Cell Name	Whee			
	When	first mid		last
TMRDFFQX1	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	63.00750	63.10790	63.62500
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	78.59030	78.67770	79.18330

### Passive power(pJ) for CLK falling (conditional):

Cell Name	When		Power(pJ)	
Cen Name	when	first	mid	last
	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	36.22370	36.33840	36.87220
	(D * !Q)	0.00000	0.00000	0.00000
TMDDEFOV1	(D * !Q)	32.84550	32.95510	33.47300
TMRDFFQX1	(!D * Q)	0.00000	0.00000	0.00000
	(!D * Q)	34.64490	34.77600	35.29330
	(!D * !Q)	0.00000	0.00000	0.00000
	(!D * !Q)	33.21300	33.33690	33.84820

# TMRDFFRNQNX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

	INP	UT	OUTPUT
D	RN	CLK	QN
x	X	X	-

## **Footprint**

Cell Name	Area
TMRDFFRNQNX1	648.90601

## **Pin Capacitance Information**

Call Name		Pin Cap(pf)	Max Cap(pf)	
Cell Name	D	RN	CLK	QN
TMRDFFRNQNX1	0.03984	0.08896	0.06777	1.90988

## **Leakage Information**

Coll Name	Leakage(nW)			
Cell Name	Min.	Avg	Max.	
TMRDFFRNQNX1	0.00000	599388.00000	943956.00000	

# **Delay Information** Delay(ns) to QN rising:

Call Name	Timing Aug(Div)	Delay(ns)		
Cell Name	Timing Arc(Dir)	First Mid La		Last
TMRDFFRNQNX1	CLK->QN (FR)	0.76715	3.32718	13.34460

**Constraint Information**Constraints(ns) for CLK falling (conditional):

Call Name	Timing Chook	Ref Pin(trans)	When	Refere	nce Slew	Rate(ns)
Cen Name	Cell Name Timing Check		wnen	first	mid	last
TMRDFFRNQNX1	min_pulse_width	CLK ()	(!D * RN)	0.49510	2.66235	16.50020

## **Power Information**

Internal switching power(pJ) to QN rising:

Call Name	T4	Power(pJ)			
Cell Name	Input	first	mid	last	
TMDDEEDNONV1	CLK	0.00000	0.00000	0.00000	
TMRDFFRNQNX1	CLK	483986.00000	483994.00000	484006.00000	

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

Call Name	XX/I	Power(pJ)			
Cell Name	When	first	mid	last	
TMRDFFRNQNX1	(CLK * RN * !QN)	0.00000	0.00000	0.00000	
	(CLK * RN * !QN)	403891.00000	403892.00000	403889.00000	
	(!CLK * RN * QN)	0.00000	0.00000	0.00000	
	(!CLK * RN * QN)	430114.00000	430114.00000	430115.00000	

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

Cell Name	Whon	Power(pJ)			
Cen Name	Cell Name When		mid	last	
TMDDEEDNONY1	(!CLK * RN * QN)	0.00000	0.00000	0.00000	
TMRDFFRNQNX1	(!CLK * RN * QN)	484211.00000	484212.00000	484215.00000	

# TMRDFFRNQX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

	INP	UT	OUTPUT
D	RN	CLK	Q
X	X	X	-

# **Footprint**

Cell Name	Area	
TMRDFFRNQX1	665.33398	

# **Pin Capacitance Information**

Call Nama		Pin Cap(pf)	Max Cap(pf)	
Cell Name	D	RN	CLK	Q
TMRDFFRNQX1	0.03983	0.08898	0.06783	8.24161

# **Leakage Information**

Call Name	Leakage(nW)			
Cell Name	Min.	Avg	Max.	
TMRDFFRNQX1	0.00000	599844.00000	944539.00000	

# **Delay Information** Delay(ns) to Q falling:

Call Name	Timing Aug(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First	Mid	Last	
TMRDFFRNQX1	CLK->Q (FF)	0.73813	2.81551	13.64040	

**Constraint Information**Constraints(ns) for CLK falling (conditional):

Call Name	Timing Check	Dof Din(tuons)	Whom	Refere	nce Slew	Rate(ns)
Cell Name	Timing Check	Ref Pin(trans) W	When	first	mid	last
TMRDFFRNQX1	min_pulse_width	CLK ()	(!D * RN)	0.48856	2.66235	16.50020

## **Power Information**

### Internal switching power(pJ) to Q falling:

Call Name	T4	Power(pJ)				
Cell Name	Input	first	mid	last		
TMDDEEDNOV1	CLK	-0.05433	-1.47488	-13.32260		
TMRDFFRNQX1	CLK	484277.00000	484286.00000	484297.00000		

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

Call Name	XX/I	Power(pJ)				
Cell Name	When	first	mid	last		
TMRDFFRNQX1	(CLK * RN * Q)	0.00000	0.00000	0.00000		
	(CLK * RN * Q)	404154.00000	404154.00000	404152.00000		
	(!CLK * RN * !Q)	0.00000	0.00000	0.00000		
	(!CLK * RN * !Q)	430652.00000	430651.00000	430652.00000		

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

Coll Name	When	Power(pJ)			
Cell Name	Cen Name when		mid	last	
TMRDFFRNQX1	(!CLK * RN * !Q)	0.00000	0.00000	0.00000	
	(!CLK * RN * !Q)	484524.00000	484524.00000	484527.00000	

# TMRDFFSNQNX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

	INP	UT	OUTPUT
D	SN	CLK	QN
0	1	R	0
1	1	R	1
x	0	x	1
x	1	x	IQN

# **Footprint**

Cell Name	Area
TMRDFFSNQNX1	616.04999

# **Pin Capacitance Information**

Call Name		Pin Cap(pf)	Max Cap(pf)	
Cell Name	D	SN	CLK	QN
TMRDFFSNQNX1	0.04043	0.06715	0.07093	3.08696

# **Leakage Information**

Call Name	Leakage(nW)			
Cell Name	Min.	Avg	Max.	
TMRDFFSNQNX1	0.00000	85.23720	151.46700	

# **Delay Information** Delay(ns) to QN rising:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First	Mid	Last	
TMRDFFSNQNX1	CLK->QN (RR)	0.47324	1.68623	7.50219	
	SN->QN (FR)	0.55899	1.87685	8.19582	

### Delay(ns) to QN falling:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First Mid		Last	
TMRDFFSNQNX1	CLK->QN (RF)	0.31257	0.72655	2.14916	

### **Constraint Information**

**Constraints(ns) for D rising:** 

Cell Name	Timing Check Dof Dig (August		Reference Slew Rate(ns)			
	Timing Check	Ref Pin(trans) first mid		mid	last	
TMRDFFSNQNX1	hold	CLK (R)	0.01427	0.05309	0.63107	
	setup	CLK (R)	0.12855	0.29138	0.84885	

#### **Constraints(ns) for D falling:**

Cell Name	Timing Chash	Dof Din(tuons)	Reference Slew Rate(ns)			
	Timing Check	Ref Pin(trans)	first	last		
TMRDFFSNQNX1	hold	CLK (R)	-0.12872	-0.30774	-1.05647	
	setup	CLK (R)	0.16438	0.40425	1.57377	

### **Constraints(ns) for D rising (conditional):**

Cell Name Timing Check	Timing Chook I	Ref Pin(trans)	When	Reference Slew Rate(ns)		
	Tilling Check	Kei Fill(trails)		first	mid	last
TMRDFFSNQNX1	hold	CLK (R)	SN	0.01427	0.05309	0.63107
	setup	CLK (R)	SN	0.12855	0.29138	0.84885

### **Constraints(ns) for D falling (conditional):**

Call Name	Cell Name Timing Check Ref Pin(trans) Who	Dof Din(tuons) Who		Refere	nce Slew R	ate(ns)
Cen Name		wnen	first	mid	last	
hold	hold	CLK (R)	SN	-0.12872	-0.30774	-1.05647
IMRDFFSNQNXI	TMRDFFSNQNX1 setup	CLK (R)	SN	0.16438	0.40425	1.57377

#### **Constraints(ns) for SN rising:**

Call Name	Timing Cheek Dof Din(trong)		Reference Slew Rate(ns)		
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNQNX1	recovery	CLK (R)	0.03384	0.03064	0.27681
	removal	CLK (R)	-0.01259	-0.01108	-0.10599

### **Constraints(ns) for SN rising (conditional):**

Call Name	Call Name Timing Check Dof Div(tuons)	W/hon	Reference Slew Rate(ns)			
Cell Name	Timing Check	Ref Pin(trans)	When	first	mid	last
recovery	CLK (R)	!D	0.03384	0.03064	0.27681	
TMRDFFSNQNX1	removal	CLK (R)	!D	-0.01259	-0.01108	-0.10599

### **Constraints(ns) for SN falling (conditional):**

Call Name	Timing Chash	Ref	VVII- o	Reference Slew Rate(ns)			
Cell Name	Timing Check	Pin(trans)	When	first	mid	last	
	min_pulse_width	<b>SN</b> ()	(CLK * D)	0.42969	2.66235	16.50020	
	min_pulse_width	SN()	(CLK * !D)	0.42969	2.66235	16.50020	
TMRDFFSNQNX1	min_pulse_width	SN ()	(!CLK * D)	0.42969	2.66235	16.50020	
	min_pulse_width	SN ()	(!CLK * !D)	0.42969	2.66235	16.50020	

### **Constraints(ns) for CLK rising (conditional):**

Cell Name Timing Check Ref Pin(trans)	Whon	Reference Slew Rate(ns)				
	Kei Pin(trans)	When	first	mid	last	
TMRDFFSNQNX1	min_pulse_width	CLK ()	(D * SN)	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	(!D * SN)	0.42969	2.66235	16.50020

### **Constraints(ns) for CLK falling (conditional):**

Call Name	Timing Chask	Ref Pin(trans)	Ref Pin(trans) When	Refere	nce Slew	Rate(ns)
Cell Name	Timing Check			first	mid	last
	min_pulse_width	CLK ()	(D * SN)	0.42969	2.66235	16.50020
TMRDFFSNQNX1	min_pulse_width	CLK ()	(!D * SN)	0.42969	2.66235	16.50020

### **Power Information**

Internal switching power(pJ) to QN rising:

Call Name	T4	Power(pJ)			
Cell Name	Input	first	mid	last	
	CLK	0.00000	0.00000	0.00000	
TMRDFFSNQNX1	CLK	56.55360	56.67410	57.26160	
	SN	54.93920	55.17290	55.96780	

### Internal switching power(pJ) to QN falling:

Call Name	Innut	Power(pJ)				
Cell Name	Input	first	mid	last		
TANDDEECNIONIV1	CLK	0.00000	0.00000	0.00000		
TMRDFFSNQNX1	CLK	105.53800	105.63300	106.14700		

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

Cell Name	W/le our	Power(pJ)			
	When	first	mid	last	
	(CLK * SN * !QN)	0.00000	0.00000	0.00000	
	(CLK * SN * !QN)	101.11500	101.11300	101.11400	
TMDDEECNONV1	(CLK * QN) + (!CLK * !SN * QN)	0.00000	0.00000	0.00000	
TMRDFFSNQNX1	(CLK * QN) + (!CLK * !SN * QN)	69.03860	69.10600	69.43700	
	(!CLK * SN)	0.00000	0.00000	0.00000	
	(!CLK * SN)	32.81540	32.91440	33.41480	

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

Cell Name	When	Power(pJ)			
Cen Ivame	vv nen	first	mid	last	
	(CLK * SN * !QN)	0.00000	0.00000	0.00000	
	(CLK * SN * !QN)	102.95400	102.95500	102.95400	
TMDDEECNONV1	(CLK * QN) + (!CLK * !SN * QN)	0.00000	0.00000	0.00000	
TMRDFFSNQNX1	(CLK * QN) + (!CLK * !SN * QN)	47.84680	47.92870	48.26910	
	(!CLK * SN)	0.00000	0.00000	0.00000	
	(!CLK * SN)	46.31340	46.44150	46.95020	

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

Cell Name	W/h ore	Power(pJ)			
	When	first	mid	last	
	(CLK * QN) + (!CLK * D * QN)	0.00000	0.00000	0.00000	
TAMBBEECKONW1	(CLK * QN) + (!CLK * D * QN)	51.93780	51.94190	51.94780	
TMRDFFSNQNX1	(!CLK * !D * QN)	0.00000	0.00000	0.00000	
	(!CLK * !D * QN)	39.58880	39.68870	40.15720	

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

Cell Name	W/horn	Power(pJ)			
	When	first	mid	last	
	(CLK * QN) + (!CLK * D * QN)	0.00000	0.00000	0.00000	
TMDDEECNONV1	(CLK * QN) + (!CLK * D * QN)	55.78580	55.85830	56.10270	
TMRDFFSNQNX1	(!CLK * !D * QN)	0.00000	0.00000	0.00000	
	(!CLK * !D * QN)	10.94590	11.11190	11.75640	

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

Call Name	W/h or		Power(pJ)	
Cell Name	When	first	mid	last
	(D * QN)	0.00000	0.00000	0.00000
	(D * QN)	56.42500	56.53010	57.08050
TAIDDEECLOUV1	(!D * SN * !QN)	0.00000	0.00000	0.00000
TMRDFFSNQNX1	(!D * SN * !QN)	105.20800	105.29900	105.79400
	(!D * !SN * QN)	0.00000	0.00000	0.00000
	(!D * !SN * QN)	29.17000	29.32230	29.95260

### Passive power(pJ) for CLK falling (conditional):

Call Name	XX/h ou		Power(pJ)			
Cell Name	When	first	mid	last		
	(D * SN * !QN)	0.00000	0.00000	0.00000		
	(D * SN * !QN)	40.71700	40.83790	41.40850		
	(D * QN)	0.00000	0.00000	0.00000		
	(D * QN)	30.74900	30.86980	31.46480		
TMDDEECNONV1	(!D * SN * QN)	0.00000	0.00000	0.00000		
TMRDFFSNQNX1	(!D * SN * QN)	45.34150	45.47580	46.03410		
	(!D * SN * !QN)	0.00000	0.00000	0.00000		
	(!D * SN * !QN)	55.26570	55.39020	55.92520		
	(!D * !SN * QN)	0.00000	0.00000	0.00000		
	(!D * !SN * QN)	10.11780	10.26260	10.99670		

# TMRDFFSNQX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

	INP	UT	OUTPUT
D	SN	CLK	Q
0	1	R	0
1	1	R	1
X	0	x	1
X	1	x	IQ

# **Footprint**

Cell Name	Area
TMRDFFSNQX1	632.47803

# **Pin Capacitance Information**

Call Name	Pin Cap(pf)			Max Cap(pf)	
Cell Name	D	SN	CLK	Q	
TMRDFFSNQX1	0.04036	0.06958	0.07086	5.19317	

## **Leakage Information**

Call Nama	Leakage(nW)			
Cell Name	Min.	Avg	Max.	
TMRDFFSNQX1	0.00000	85.20620	149.46600	

# **Delay Information** Delay(ns) to Q rising:

Call Name	Timing Ana(Din)		Delay(ns)	
Cell Name	Timing Arc(Dir)	First Mid		Last
TMRDFFSNQX1	CLK->Q (RR)	0.35257	1.33769	7.04551
	SN->Q (FR)	0.28480	1.45638	7.89625

### Delay(ns) to Q falling:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First Mid Last			
TMRDFFSNQX1	CLK->Q (RF)	0.55229	1.31751	5.53605	

### **Constraint Information**

**Constraints(ns) for D rising:** 

Cell Name	Timing Charle	Reference Slew R		Rate(ns)	
	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNQX1	hold	CLK (R)	0.01210	0.04031	0.46069
	setup	CLK (R)	0.14971	0.31364	0.91674

### **Constraints(ns) for D falling:**

Cell Name	Timing Charle	Reference Slew Rate(ns)			ate(ns)
	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNQX1	hold	CLK (R)	-0.12656	-0.31296	-1.10931
	setup	CLK (R)	0.15525	0.36583	1.44070

### **Constraints(ns) for D rising (conditional):**

Cell Name Timing Check	Timing Chook	Ref Pin(trans) When Reference Slew Rate(ns			ate(ns)	
	Kei Fill(trails)	ef Pin(trans) When	first	mid	last	
TMRDFFSNQX1	hold	CLK (R)	SN	0.01210	0.04031	0.46069
	setup	CLK (R)	SN	0.14971	0.31364	0.91674

### **Constraints(ns) for D falling (conditional):**

Cell Name	Timing Check	Dof Din(tuons)	Ref Pin(trans) When	Reference Slew Rate(ns)			
	Timing Check	Kei Pin(trans)		first	mid	last	
TMRDFFSNQX1	hold	CLK (R)	SN	-0.12656	-0.31296	-1.10931	
	setup	CLK (R)	SN	0.15525	0.36583	1.44070	

### **Constraints(ns) for SN rising:**

Call Name	Timing Charle	Reference Slev			ate(ns)
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNQX1	recovery	CLK (R)	0.02649	0.16056	3.67981
	removal	CLK (R)	-0.01122	-0.01108	-0.10886

### **Constraints(ns) for SN rising (conditional):**

Cell Name Timing Check	Timing Charle	ing Check Ref Pin(trans)	When	Reference Slew Rate(ns)		
	1 iming Check			first	mid	last
TMRDFFSNQX1 removal	recovery	CLK (R)	!D	0.02649	0.16056	3.67981
	removal	CLK (R)	!D	-0.01122	-0.01108	-0.10886

### **Constraints(ns) for SN falling (conditional):**

Cell Name	Timin a Chaola	Ref	XX/la oza	Reference Slew Rate(ns)			
	Timing Check P	Pin(trans)	When	first	mid	last	
	min_pulse_width	SN ()	(CLK * D)	0.42969	2.66235	16.50020	
	min_pulse_width	SN ()	(CLK * !D)	0.42969	2.66235	16.50020	
TMRDFFSNQX1	min_pulse_width	SN ()	(!CLK * D)	0.42969	2.66235	16.50020	
	min_pulse_width	SN ()	(!CLK * !D)	0.42969	2.66235	16.50020	

### **Constraints(ns) for CLK rising (conditional):**

Cell Name	Timin a Charle	Dof Din(trong)	XX/In one	Reference Slew Rate(ns)		
	Timing Check Ref Pi	Ref Pin(trans)	When	first	mid	last
TMRDFFSNQX1	min_pulse_width	CLK ()	(D * SN)	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	(!D * SN)	0.42969	2.66235	16.50020

### $Constraints (ns) \ for \ CLK \ falling \ (conditional):$

Cell Name	Timing Charle	Ref Pin(trans)	XX/In one	Reference Slew Rate(ns)			
	Timing Check		When	first	mid	last	
TMRDFFSNQX1	min_pulse_width	CLK ()	(D * SN)	0.42969	2.66235	16.50020	
	min_pulse_width	CLK ()	(!D * SN)	0.42969	2.66235	16.50020	

### **Power Information**

Internal switching power(pJ) to Q rising:

Call Name	I4	Power(pJ)			
Cell Name	Input	first	mid	last	
	CLK	0.00000	0.00000	0.00000	
TMRDFFSNQX1	CLK	58.90650	59.01830	59.56450	
	SN	57.80580	57.95460	58.46270	

### Internal switching power(pJ) to Q falling:

Call Nama	Immut	Power(pJ)			
Cell Name	Input	first	mid	last	
TMRDFFSNQX1	CLK	0.00000	0.00000	0.00000	
	CLK	105.54200	105.64500	106.18400	

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

Call Name	XX/b o :-	Power(pJ)			
Cell Name	When	first	mid	last	
	(CLK * SN * !Q)	0.00000	0.00000	0.00000	
	(CLK * SN * !Q)	100.05700	100.06000	100.06200	
TMDDEECNOV1	(CLK * Q) + (!CLK * !SN * Q)	0.00000	0.00000	0.00000	
TMRDFFSNQX1	(CLK * Q) + (!CLK * !SN * Q)	79.38370	79.45190	79.78540	
	(!CLK * SN)	0.00000	0.00000	0.00000	
	(!CLK * SN)	40.16770	40.26650	40.76510	

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

Call Name	XVII. o re	Power(pJ)			
Cell Name	When	first	mid	last	
	(CLK * SN * !Q)	0.00000	0.00000	0.00000	
	(CLK * SN * !Q)	101.96800	101.97000	101.97000	
TMDDEECNOV1	(CLK * Q) + (!CLK * !SN * Q)	0.00000	0.00000	0.00000	
TMRDFFSNQX1	(CLK * Q) + (!CLK * !SN * Q)	55.89770	55.97990	56.31590	
	(!CLK * SN)	0.00000	0.00000	0.00000	
	(!CLK * SN)	54.54100	54.66840	55.17850	

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

Call Name	W/le ore	Power(pJ)			
Cell Name	When	first	mid	last	
	(CLK * Q) + (!CLK * D * Q)	0.00000	0.00000	0.00000	
TMDDEECNOV1	(CLK * Q) + (!CLK * D * Q)	55.42420	55.42800	55.43210	
TMRDFFSNQX1	(!CLK * !D * Q)	0.00000	0.00000	0.00000	
	(!CLK * !D * Q)	44.35180	44.45180	44.92910	

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

Call Name	XX/In our	Power(pJ)			
Cell Name	When	first	mid	last	
TMRDFFSNQX1	(CLK * Q) + (!CLK * D * Q)	0.00000	0.00000	0.00000	
	(CLK * Q) + (!CLK * D * Q)	58.77930	58.78370	58.78380	
	(!CLK * !D * Q)	0.00000	0.00000	0.00000	
	(!CLK * !D * Q)	12.09730	12.22010	12.72150	

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

Cell Name	When	Power(pJ)		
Cen Name	vvnen	first	mid	last
	(D * Q)	0.00000	0.00000	0.00000
	(D * Q)	59.45670	59.56310	60.10070
TMDDEECNOV1	(!D * SN * !Q)	0.00000	0.00000	0.00000
TMRDFFSNQX1	(!D * SN * !Q)	104.87500	104.96400	105.47700
	(!D * !SN * Q)	0.00000	0.00000	0.00000
	(!D * !SN * Q)	33.17800	33.33270	33.97920

### Passive power(pJ) for CLK falling (conditional):

Call Name	XX/1	Power(pJ)			
Cell Name	vv nen	first mid  N*!Q) 0.00000 0.00000  N*!Q) 40.86060 40.98260  *Q) 0.00000 0.00000  *Q) 37.77460 37.89610  SN*Q) 0.00000 0.00000  SN*Q) 54.54220 54.67420  N*!Q) 0.00000 0.00000  N*!Q) 53.49410 53.61080	last		
	(D * SN * !Q)	0.00000	0.00000	0.00000	
	(D * SN * !Q)	40.86060	40.98260	41.56240	
	(D * Q)	0.00000	0.00000	0.00000	
	(D * Q)	37.77460	37.89610	38.48170	
	(!D * SN * Q)	0.00000	0.00000	0.00000	
TMRDFFSNQX1	(!D * SN * Q)	54.54220	54.67420	55.23370	
	(!D * SN * !Q)	0.00000	0.00000	0.00000	
	(!D * SN * !Q)	53.49410	53.61080	54.12870	
	(!D * !SN * Q)	0.00000	0.00000	0.00000	
	(!D * !SN * Q)	11.60820	11.75080	12.47430	

# TMRDFFSNRNQNX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

### **Truth Table**

	IN	OUTPUT		
D	RN	SN	CLK	Q
0	1	1	R	0
1	1	1	R	1
x	0	X	x	0
x	1	0	x	1
X	1	1	x	IQ

# **Footprint**

Cell Name	Area
TMRDFFSNRNQNX1	714.61798

# **Pin Capacitance Information**

Call Name		Max Cap(pf)			
Cell Name	D	RN	SN	CLK	Q
TMRDFFSNRNQNX1	0.04195	0.10404	0.07577	0.07534	3.09229

# **Leakage Information**

Call Name	Leakage(nW)			
Cell Name	Min. Avg		Max.	
TMRDFFSNRNQNX1	0.00000	97.39300	168.17500	

# **Delay Information** Delay(ns) to Q rising:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First	Mid	Last	
TMRDFFSNRNQNX1	CLK->Q (RR)	0.56598	1.81077	7.70300	
	RN->Q (RR)	0.58446	1.97713	8.34619	
	SN->Q (FR)	0.45750	1.80996	8.29121	

### Delay(ns) to Q falling:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First	Mid	Last	
TIMDDEECNIDAIONIVA	CLK->Q (RF)	0.32155	0.74692	2.20609	
TMRDFFSNRNQNX1	RN->Q (FF)	0.23547	0.86499	3.02621	

### **Constraint Information**

**Constraints(ns) for D rising:** 

Call Name	Timing Charle	Ref Pin(trans)	Reference Slew Rate(ns)			
Cell Name	Cell Name Timing Check		first	mid	last	
TAMBBEECAIDAIONINA	hold	CLK (R)	-0.01497	0.02241	1.88529	
TMRDFFSNRNQNX1	QNX1 setup	CLK (R)	0.15152	0.28008	0.59867	

### **Constraints(ns) for D falling:**

Call Name	Timin a Chaale	Dof Div(tuons)	Reference Slew Rate(ns)			
Cell Name Timing Check		Ref Pin(trans)	first	mid	last	
TMDDEECNDNONV1	hold	CLK (R)	-0.12216	-0.29357	-1.00204	
TMRDFFSNRNQNX1 setu	setup	CLK (R)	0.16818	0.43683	2.03192	

### **Constraints(ns) for D rising (conditional):**

Cell Name Timing	Ref	XX/I	Reference Slew Rate(ns)			
Cell Name	Check	Pin(trans)	When	first	mid	last
	hold	CLK (R)	(RN * SN)	-0.01497	0.02241	1.88529
TMRDFFSNRNQNX1	setup	CLK (R)	(RN * SN)	0.15152	0.28008	0.59867

### Constraints(ns) for D falling (conditional):

Call Name	Timing	Check Pin(trans) When	XX/I	Reference Slew Rate(ns)		
Cell Name	Check		first	mid	last	
hold	CLK (R)	(RN * SN)	-0.12216	-0.29357	-1.00204	
TMRDFFSNRNQNX1	setup	CLK (R)	(RN * SN)	0.16818	0.43683	2.03192

### **Constraints(ns) for RN rising:**

Cell Name	Timing Charle	ming Check Ref Pin(trans)		Reference Slew Rate(ns)			
	Timing Check Ref Pin(tran		first	mid	last		
	recovery	CLK (R)	0.15377	0.50058	6.50874		
TAMBBEECAIDAIONIVI	removal	CLK (R)	-0.02459	-0.03047	-0.06959		
TMRDFFSNRNQNX1	hold	SN (R)	-0.00779	-0.05262	-0.11002		
	setup	SN (R)	0.09553	0.16226	0.69732		

#### **Constraints(ns) for RN rising (conditional):**

Call Name	Timing	Ref	XX71	Refere	nce Slew R	Rate(ns)
Cell Name	Check Pin(trans)	When	first	mid	last	
	recovery	CLK (R)	(D * SN)	0.15377	0.50058	6.50874
	removal	CLK (R)	(D * SN)	-0.02459	-0.03047	-0.06959
	hold	SN (R)	(CLK * D)	-0.00779	-0.05262	-0.11002
	hold	SN (R)	(CLK * !D)	-0.00916	-0.05262	-0.11439
	hold	SN (R)	(!CLK * D)	-0.07584	-0.13294	-0.23257
TMRDFFSNRNQNX1	hold	SN (R)	(!CLK * !D)	-0.07970	-0.13571	-0.23817
	setup	SN (R)	(CLK * D)	0.01703	0.05769	0.22968
	setup	SN (R)	(CLK * !D)	0.01817	0.05874	0.25951
	setup	SN (R)	(!CLK * D)	0.09367	0.15710	0.52847
	setup	SN (R)	(!CLK * !D)	0.09553	0.16226	0.69732

#### **Constraints(ns) for RN falling (conditional):**

Call Name	Timing Chash	Ref	Ref When		Reference Slew Rate(ns)			
Cell Name	Timing Check	Pin(trans)	When	first	mid	last		
n	min_pulse_width	RN ()	(CLK * D * SN)	0.42969	2.66235	16.50020		
TMDDEECNDNONY1	min_pulse_width	RN ()	(CLK * !D * SN)	0.42969	2.66235	16.50020		
TMRDFFSNRNQNX1	min_pulse_width	RN ()	(!CLK * D * SN)	0.42969	2.66235	16.50020		
	min_pulse_width	RN ()	(!CLK * !D * SN)	0.42969	2.66235	16.50020		

#### **Constraints(ns) for SN rising:**

Cell Name	Timing Charle	Timing Charles Def Disc(4ssess)		Reference Slew Rate(ns)			
	Timing Check	Ref Pin(trans)	first	mid	last		
	recovery	CLK (R)	0.01776	-0.00400	0.21138		
TMDDEECNDNONY1	removal	CLK (R)	0.00907	0.02770	0.01826		
TMRDFFSNRNQNX1	hold	RN (R)	0.11426	0.23541	0.50235		
	setup	RN (R)	0.01141	0.01892	0.65308		

# $Constraints (ns) \ for \ SN \ rising \ (conditional):$

Cell Name	Timing	Ref	When	Referer	Reference Slew Rate(ns)		
Cen Name	Check	Pin(trans)	vvnen	first	mid	last	
	recovery	CLK (R)	(!D * RN)	0.01776	-0.00400	0.21138	
	removal	CLK (R)	(!D * RN)	0.00907	0.02770	0.01826	
	hold	RN (R)	CLK	0.06553	0.16064	0.36014	
	hold	RN (R)	(!CLK * D)	0.10944	0.22434	0.48618	
TMRDFFSNRNQNX1	hold	RN (R)	(!CLK * !D)	0.11426	0.23541	0.50235	
	setup	RN (R)	CLK	0.01141	0.01892	0.57553	
	setup	RN (R)	(!CLK * D)	-0.06458	-0.07492	0.65308	
	setup	RN (R)	(!CLK * !D)	-0.07145	-0.10849	0.08098	

#### **Constraints(ns) for SN falling (conditional):**

Call Name	Timing Chask	Timing Cheek Ref		Reference Slew Rate(ns)			
Cell Name	Timing Check	Pin(trans)	When	first	mid	last	
	min_pulse_width	SN ()	(CLK * D * RN)	0.42969	2.66235	16.50020	
TMDDEECNDMONY1	min_pulse_width	SN ()	(CLK * !D * RN)	0.42969	2.66235	16.50020	
TMRDFFSNRNQNX1	min_pulse_width	SN ()	(!CLK * D * RN)	0.42969	2.66235	16.50020	
min_pulse_width	SN ()	(!CLK * !D * RN)	0.42969	2.66235	16.50020		

#### **Constraints(ns) for CLK rising (conditional):**

Cell Name Timing	Timing Chook	Ref	When	Refere	nce Slew	Rate(ns)
	Timing Check	Pin(trans)	when	first	mid	last
	min_pulse_width	CLK ()	(D * RN * SN)	0.42969	2.66235	16.50020
TMRDFFSNRNQNX1	min_pulse_width	CLK ()	(!D * RN * SN)	0.42969	2.66235	16.50020

# $Constraints (ns) \ for \ CLK \ falling \ (conditional):$

Cell Name Timing Check	Timing Chook	Ref	When	Refere	nce Slew	Rate(ns)
	Pin(trans)	vviien	first	mid	last	
TMDDEECNDNONV1	min_pulse_width	CLK ()	(D * RN * SN)	0.42969	2.66235	16.50020
TMRDFFSNRNQNX1	min_pulse_width	CLK ()	(!D * RN * SN)	0.42969	2.66235	16.50020

# **Power Information**

Internal switching power(pJ) to Q rising:

Call Name	Innut		Power(pJ)	
Cell Name	Input	first	mid	last
	CLK	0.00000	0.00000	0.00000
TIMB DEECND NO. 1971	CLK	94.34080	94.43750	94.96560
TMRDFFSNRNQNX1	RN	95.16550	95.28360	96.30980
	SN	94.17200	94.40600	95.17960

#### Internal switching power(pJ) to Q falling:

Call Name	T4	Power(pJ)				
Cell Name	Input	first	mid	last		
	CLK	0.00000	0.00000	0.00000		
TMDDEECNDNONW1	CLK	97.44600	97.53310	98.02710		
TMRDFFSNRNQNX1	RN	-0.05444	-0.82084	-5.00951		
	RN	98.98910	99.23560	100.04300		

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

Call Name	XX/b our	Power(pJ)			
Cell Name	When	first	mid	last	
	(CLK * RN * SN * !Q) + (CLK * !RN * !Q) + (!CLK * !RN * !Q)	0.00000	0.00000	0.00000	
	(CLK * RN * SN * !Q) + (CLK * !RN * !Q) + (!CLK * !RN * !Q)	99.64630	99.67500	99.83210	
TMRDFFSNRNQNX1	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	93.55540	93.64230	94.12860	
	(!CLK * RN * SN)	0.00000	0.00000	0.00000	
	(!CLK * RN * SN)	50.17670	50.26590	50.75460	

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

Cell Name	W/h ore	Power(pJ)			
Cen Name	When	first	mid	last	
	(CLK * RN * SN * !Q) + (CLK * !RN * !Q) + (!CLK * !RN * !Q)	0.00000	0.00000	0.00000	
	(CLK * RN * SN * !Q) + (CLK * !RN * !Q) + (!CLK * !RN * !Q)	95.53120	95.53120	95.53030	
TMRDFFSNRNQNX1	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	59.88230	59.96130	60.30380	
	(!CLK * RN * SN)	0.00000	0.00000	0.00000	
	(!CLK * RN * SN)	50.24800	50.37560	50.90030	

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

Call Name	W/h ore	Power(pJ)			
Cell Name	When	first	mid	last	
TMRDFFSNRNQNX1	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	0.00000	0.00000	0.00000	
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	91.68560	91.68430	91.68270	
	(!CLK * D * SN * !Q)	0.00000	0.00000	0.00000	
	(!CLK * D * SN * !Q)	51.92760	52.01610	52.48560	

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

Call Massa	XX/I	Power(pJ)			
Cell Name	When	first	mid	last	
TMRDFFSNRNQNX1	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	0.00000	0.00000	0.00000	
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	96.98160	96.98230	96.98170	
	(!CLK * D * SN * !Q)	0.00000	0.00000	0.00000	
	(!CLK * D * SN * !Q)	55.22470	55.33580	55.81390	

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

Call Name	W/h ore	Power(pJ)			
Cell Name	When	first	mid	last	
TMRDFFSNRNQNX1	(CLK * RN * Q) + (!CLK * D * RN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * Q) + (!CLK * D * RN * Q)	88.04120	88.05060	88.05560	
	(!RN * !Q)	0.00000	0.00000	0.00000	
	(!RN * !Q)	98.44360	98.64790	99.62020	
	(!CLK * !D * RN * Q)	0.00000	0.00000	0.00000	
	(!CLK * !D * RN * Q)	49.41780	49.51550	49.98620	

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

Cell Name	W/la ora	Power(pJ)			
	When	first	mid	last	
TMRDFFSNRNQNX1	(CLK * RN * Q) + (!CLK * D * RN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * Q) + (!CLK * D * RN * Q)	92.90720	92.97780	93.22110	
	(!RN * !Q)	0.00000	0.00000	0.00000	
	(!RN * !Q)	16.48660	16.73700	17.77300	
	(!CLK * !D * RN * Q)	0.00000	0.00000	0.00000	
	(!CLK * !D * RN * Q)	18.08370	18.24710	18.89150	

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

Call Name	<b>X</b> Y/b o :-	Power(pJ)			
Cell Name	When	first	mid	last	
	(D * RN * Q)	0.00000	0.00000	0.00000	
TMRDFFSNRNQNX1	(D * RN * Q)	93.96520	94.04960	94.54680	
	(D * !RN * !Q) + (!D * RN * SN * !Q) + (!D * !RN * !Q)	0.00000	0.00000	0.00000	
	(D * !RN * !Q) + (!D * RN * SN * !Q) + (!D * !RN * !Q)	97.54890	97.63680	98.11170	
	(!D * RN * !SN * Q)	0.00000	0.00000	0.00000	
	(!D * RN * !SN * Q)	51.19600	51.33720	51.94990	

# Passive power(pJ) for CLK falling (conditional):

Cell Name	W/le oue	Power(pJ)			
Cen Name	When	first	mid	last	
	(D * RN * SN * !Q)	0.00000	0.00000	0.00000	
	(D * RN * SN * !Q)	54.10840	54.22490	54.74880	
	(D * RN * Q)	0.00000	0.00000	0.00000	
TMRDFFSNRNQNX1	(D * RN * Q)	46.36360	46.48280	47.02280	
	(D * !RN * !Q) + (!D * RN * SN * !Q) + (!D * !RN * !Q)	0.00000	0.00000	0.00000	
	(D * !RN * !Q) + (!D * RN * SN * !Q) + (!D * !RN * !Q)	55.16010	55.28210	55.81380	
	(!D * RN * SN * Q)	0.00000	0.00000	0.00000	
	(!D * RN * SN * Q)	50.25890	50.39920	50.99620	
	(!D * RN * !SN * Q)	0.00000	0.00000	0.00000	
	(!D * RN * !SN * Q)	16.45990	16.59550	17.30340	

# TMRDFFSNRNQX1

TMR\_sky130\_rhbd\_tt\_1P8\_25C.ccs Cell Library: Process, Voltage 1.80, Temp 25.00

# **Truth Table**

INPUT			OUTPUT	
D	RN	SN	CLK	Q
0	1	1	R	0
1	1	1	R	1
X	X	0	X	1
x	0	1	X	0
X	1	1	X	IQ

# **Footprint**

Cell Name	Area
TMRDFFSNRNQX1	731.04602

# **Pin Capacitance Information**

Pin Cap(pf)				Max Cap(pf)	
Cell Name	D	RN	SN	CLK	Q
TMRDFFSNRNQX1	0.04197	0.10289	0.07610	0.07364	5.22649

# **Leakage Information**

Cell Name	Leakage(nW)			
Cen Name	Min.	Avg	Max.	
TMRDFFSNRNQX1	0.00000	99.14950	165.06800	

# **Delay Information** Delay(ns) to Q rising:

Call Name	Timing Aug(Din)		Delay(ns)	
Cell Name	Timing Arc(Dir)	First	Mid	Last
TMDDEECNDNOV1	CLK->Q (RR)	0.39162	1.41023	7.24492
TMRDFFSNRNQX1	SN->Q (FR)	0.28301	1.46870	8.07026

# Delay(ns) to Q falling:

Call Name	Timing Ang(Din)	Delay(ns)			
Cell Name	Timing Arc(Dir)	First	Mid	Last	
	CLK->Q (RF)	0.58498	1.35825	5.61732	
TMRDFFSNRNQX1	RN->Q (FF)	0.50113	1.43956	6.19319	
	SN->Q (RF)	0.38454	1.24071	5.74578	

# **Constraint Information**

**Constraints(ns) for D rising:** 

Cell Name	Timing Charle	Dof Div(tuons)	Reference Slew Rate(ns) first mid last		
	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNRNQX1	hold	CLK (R)	-0.02056	0.00402	1.02242
	setup	CLK (R)	0.17892	0.31281	0.64112

#### **Constraints(ns) for D falling:**

Cell Name	Timing Charle	Dof Div(tuons)	Reference Slew Rate(ns) first mid last		
	Timing Check	Ref Pin(trans)	first	mid	last
TMRDFFSNRNQX1	hold	CLK (R)	-0.12215	-0.29511	-1.05099
	setup	CLK (R)	0.15629	0.38177	1.76181

#### **Constraints(ns) for D rising (conditional):**

Cell Name	Timing Check	Dof Din(trong)	When	Referen	ce Slew R	ate(ns)
	Tilling Check	Kei Fill(trails)	vv nen	first	mid	last
TMRDFFSNRNQX1	hold	CLK (R)	(RN * SN)	-0.02056	0.00402	1.02242
	setup	CLK (R)	(RN * SN)	0.17892	0.31281	0.64112

# $Constraints (ns) \ for \ D \ falling \ (conditional):$

Cell Name	Timing	Ref	XX/In ove	Reference Slew Rate(ns)			
	Check	Pin(trans)	When	first	mid	last	
TMRDFFSNRNQX1	hold	CLK (R)	(RN * SN)	-0.12215	-0.29511	-1.05099	
	setup	CLK (R)	(RN * SN)	0.15629	0.38177	1.76181	

#### **Constraints(ns) for RN rising:**

Call Name	Timing Charle	Dof Div(tuons)	Reference Slew Rate(ns)			
Cell Name	Timing Check	Ref Pin(trans)	first	first mid las 18394 0.50975 6.711 .02459 -0.03047 -0.069 07456 0.16894 0.330		
	recovery	CLK (R)	0.18394	0.50975	6.71173	
TANDDEECNIDA OVA	removal	CLK (R)	-0.02459	-0.03047	-0.06996	
TMRDFFSNRNQX1	hold	SN (R)	0.07456	0.16894	0.33070	
	setup	SN (R)	0.02152	0.07079	1.34234	

#### **Constraints(ns) for RN rising (conditional):**

Call Name	Timing	Ref	VX71	Refere	nce Slew R	Rate(ns)
Cell Name	Check	Pin(trans)	When	first	mid	last
	recovery	CLK (R)	(D * SN)	0.18394	0.50975	6.71173
	removal	CLK (R)	(D * SN)	-0.02459	-0.03047	-0.06996
	hold	SN (R)	(CLK * D)	-0.00779	-0.05262	-0.11439
	hold	SN (R)	(CLK * !D)	-0.00916	-0.05262	-0.11839
	hold	SN (R)	(!CLK * D)	0.07456	0.16340	0.32001
TMRDFFSNRNQX1	hold	SN (R)	(!CLK * !D)	0.07292	0.16894	0.33070
	setup	SN (R)	(CLK * D)	0.02152	0.07047	0.52589
	setup	SN (R)	(CLK * !D)	0.02033	0.07047	0.60177
	setup	SN (R)	(!CLK * D)	-0.00648	0.06908	1.34234
	setup	SN (R)	(!CLK * !D)	-0.00400	0.07079	1.06903

# $Constraints (ns) \ for \ RN \ falling \ (conditional):$

Call Name	Timing Chaple	Ref	VVII- o	Refere	nce Slew	Rate(ns)
Cell Name	Timing Check	Pin(trans)	When	first	mid	last
	min_pulse_width	<b>RN</b> ()	(CLK * D * SN)	0.42969	2.66235	16.50020
TMDDEECNDNOV1	min_pulse_width	<b>RN</b> ()	(CLK * !D * SN)	0.42969	2.66235	16.50020
TMRDFFSNRNQX1	min_pulse_width	RN ()	(!CLK * D * SN)	0.42969	2.66235	16.50020
	min_pulse_width	RN ()	(!CLK * !D * SN)	0.42969	2.66235	16.50020

#### **Constraints(ns) for SN rising:**

Call Name	Timing Charle	Dof Div (4mana)	Reference Slew Rate(ns)		
Cell Name	Timing Check	Ref Pin(trans)	first	mid	last
	recovery	CLK (R)	0.00594	0.14399	3.54600
TMDDEECNDNOV1	removal	CLK (R)	0.01044	0.02770	0.01939
TMRDFFSNRNQX1	hold	RN (R)	0.01179	0.05539	0.11876
	setup	RN (R)	0.03607	0.07489	0.28294

# $Constraints (ns) \ for \ SN \ rising \ (conditional):$

Call Name	Timing	Ref	Whon	Refere	nce Slew R	Rate(ns)
Cell Name	Check	Pin(trans)	When	first	mid	last
	recovery	CLK (R)	(!D * RN)	0.00594	0.14399	3.54600
	removal	CLK (R)	(!D * RN)	0.01044	0.02770	0.01939
	hold	RN (R)	CLK	0.01179	0.05539	0.11876
	hold	RN (R)	(!CLK * D)	-0.02458	-0.05816	-0.06637
TMRDFFSNRNQX1	hold	RN (R)	(!CLK * !D)	-0.02448	-0.05816	-0.07098
	setup	RN (R)	CLK	0.01652	-0.03675	0.00704
	setup	RN (R)	(!CLK * D)	0.03504	0.07393	0.28294
	setup	RN (R)	(!CLK * !D)	0.03607	0.07489	0.15175

#### **Constraints(ns) for SN falling (conditional):**

Cell Name	Timing Chask	Ref	When Reference Slew Rate			Rate(ns)
Cen Name	Timing Check	Pin(trans)	vvnen	first	mid	last
	min_pulse_width	SN ()	(CLK * D * RN)	0.42969	2.66235	16.50020
TMDDEECNDNOV1	min_pulse_width	SN ()	(CLK * !D * RN)	0.42969	2.66235	16.50020
TMRDFFSNRNQX1	min_pulse_width	SN ()	(!CLK * D * RN)	0.42969	2.66235	16.50020
	min_pulse_width	SN ()	(!CLK * !D * RN)	0.42969	2.66235	16.50020

#### **Constraints(ns) for CLK rising (conditional):**

Cell Name	The Charle	Ref	XX/I	Reference Slew Rate(ns)           first         mid         last           0.42969         2.66235         16.5002		
	Timing Check	Pin(trans)	When	first	mid	last
TMRDFFSNRNQX1	min_pulse_width	CLK ()	(D * RN * SN)	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	(!D * RN * SN)	0.42969	2.66235	16.50020

# $Constraints (ns) \ for \ CLK \ falling \ (conditional):$

Cell Name	Timing Chask	Ref	When	Reference Slew Rate(ns) first mid last		
	Timing Check	Pin(trans)	vviien	first	mid	last
TMRDFFSNRNQX1	min_pulse_width	CLK ()	(D * RN * SN)	0.42969	2.66235	16.50020
	min_pulse_width	CLK ()	(!D * RN * SN)	0.42969	2.66235	16.50020

# **Power Information**

Internal switching power(pJ) to Q rising:

C.II Nome	T4	Power(pJ)			
Cell Name	Input	first	mid	last	
	CLK	0.00000	0.00000	0.00000	
TMRDFFSNRNQX1	CLK	97.28840	97.37010	97.86440	
	SN	96.81090	97.03620	97.82530	

# Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)			
		first	mid	last	
	CLK	0.00000	0.00000	0.00000	
	CLK	98.09750	98.19580	98.71230	
TMRDFFSNRNQX1	RN	-0.05444	-1.12464	-8.46690	
	RN	99.73580	99.97530	100.78500	
	SN	98.73290	98.90860	99.84700	

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

Cell Name	When	Power(pJ)			
		first	mid	last	
TMRDFFSNRNQX1	(CLK * RN * SN * !Q) + (CLK * !RN * SN * !Q) + (CLK * !RN * !SN * Q) + (!CLK * !RN * SN * !Q) + (!CLK * !RN * !SN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * SN * !Q) + (CLK * !RN * SN * !Q) + (CLK * !RN * !SN * Q) + (!CLK * !RN * SN * !Q) + (!CLK * !RN * !SN * Q)	95.18800	95.21720	95.37570	
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	0.00000	0.00000	0.00000	
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	101.59600	101.65400	101.97100	
	(!CLK * RN * SN)	0.00000	0.00000	0.00000	
	(!CLK * RN * SN)	53.88790	53.97630	54.46330	

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

Cell Name	W/h ore	Power(pJ)		
Cen Name	When	first	mid	last
TMRDFFSNRNQX1	(CLK * RN * SN * !Q) + (CLK * !RN * SN * !Q) + (CLK * !RN * !SN * Q) + (!CLK * !RN * SN * !Q) + (!CLK * !RN * !SN * Q)	0.00000	0.00000	0.00000
	(CLK * RN * SN * !Q) + (CLK * !RN * SN * !Q) + (CLK * !RN * !SN * Q) + (!CLK * !RN * SN * !Q) + (!CLK * !RN * !SN * Q)	95.14620	95.14720	95.14640
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	0.00000	0.00000	0.00000
	(CLK * RN * Q) + (!CLK * RN * !SN * Q)	69.60500	69.68390	70.02410
	(!CLK * RN * SN)	0.00000	0.00000	0.00000
	(!CLK * RN * SN)	53.95640	54.08470	54.60540

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

Cell Name	***	Power(pJ)		
	When	first	mid	last
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	0.00000	0.00000	0.00000
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	91.11650	91.11730	91.11620
	(CLK * D * !SN * Q)	0.00000	0.00000	0.00000
	(CLK * D * !SN * Q)	98.31440	98.43440	99.42480
	(CLK * !D * !SN * Q)	0.00000	0.00000	0.00000
TMRDFFSNRNQX1	(CLK * !D * !SN * Q)	53.67870	53.78000	54.49650
	(!CLK * D * SN * !Q)	0.00000	0.00000	0.00000
	(!CLK * D * SN * !Q)	51.98860	52.07830	52.54770
	(!CLK * D * !SN * Q)	0.00000	0.00000	0.00000
	(!CLK * D * !SN * Q)	46.99530	47.16320	48.04010
	(!CLK * !D * !SN * Q)	0.00000	0.00000	0.00000
	(!CLK * !D * !SN * Q)	13.73290	13.82080	14.24730

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

Cell Name	***	Power(pJ)		
Cell Name	When	first	mid	last
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	0.00000	0.00000	0.00000
	(CLK * SN * !Q) + (!CLK * !D * SN * !Q)	98.10980	98.18280	98.44050
	(CLK * D * !SN * Q)	0.00000	0.00000	0.00000
	(CLK * D * !SN * Q)	16.10190	16.46750	17.86100
	(CLK * !D * !SN * Q)	0.00000	0.00000	0.00000
TMRDFFSNRNQX1	(CLK * !D * !SN * Q)	19.57950	19.81750	20.75230
	(!CLK * D * SN * !Q)	0.00000	0.00000	0.00000
	(!CLK * D * SN * !Q)	56.12670	56.27610	56.87400
	(!CLK * D * !SN * Q)	0.00000	0.00000	0.00000
	(!CLK * D * !SN * Q)	0.35486	0.60216	1.64264
	(!CLK * !D * !SN * Q)	0.00000	0.00000	0.00000
	(!CLK * !D * !SN * Q)	0.27427	0.39008	0.85524

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

Cell Name	When	Power(pJ)		
		first	mid	last
TMRDFFSNRNQX1	(CLK * RN * Q) + (!CLK * D * RN * Q)	0.00000	0.00000	0.00000
	(CLK * RN * Q) + (!CLK * D * RN * Q)	92.01890	92.02490	92.02800
	(!CLK * !D * RN * Q)	0.00000	0.00000	0.00000
	(!CLK * !D * RN * Q)	53.55810	53.65490	54.13270

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

Cell Name	When	Power(pJ)		
		first	mid	last
TMRDFFSNRNQX1	(CLK * RN * Q) + (!CLK * D * RN * Q)	0.00000	0.00000	0.00000
	(CLK * RN * Q) + (!CLK * D * RN * Q)	95.58520	95.58620	95.58660
	(!CLK * !D * RN * Q)	0.00000	0.00000	0.00000
	(!CLK * !D * RN * Q)	19.40660	19.52760	20.02800

#### Passive power(pJ) for CLK rising (conditional):

Cell Name	***	Power(pJ)		
	When	first	mid	last
	(D * RN * Q)	0.00000	0.00000	0.00000
	(D * RN * Q)	97.40420	97.48760	97.97250
TMRDFFSNRNQX1	(D * !RN * SN * !Q) + (D * !RN * !SN * Q) + (!D * RN * SN * !Q) + (!D * !RN * SN * !Q) + (!D * !RN * !SN * Q)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q) + (D * !RN * !SN * Q) + (!D * RN * SN * !Q) + (!D * !RN * SN * !Q) + (!D * !RN * !SN * Q)	97.66490	97.75090	98.24920
	(!D * RN * !SN * Q)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q)	55.03920	55.18580	55.80810

# Passive power(pJ) for CLK falling (conditional):

Cell Name	***	Power(pJ)		
	When	first	mid	last
	(D * RN * SN * !Q)	0.00000	0.00000	0.00000
	(D * RN * SN * !Q)	51.39410	51.51590	52.02590
	(D * RN * Q)	0.00000	0.00000	0.00000
	(D * RN * Q)	55.41210	55.52760	56.06510
TMRDFFSNRNQX1	(D * !RN * SN * !Q) + (D * !RN * !SN * Q) + (!D * RN * SN * !Q) + (!D * !RN * SN * !Q) + (!D * !RN * !SN * Q)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q) + (D * !RN * !SN * Q) + (!D * RN * SN * !Q) + (!D * !RN * SN * !Q) + (!D * !RN * !SN * Q)	51.72090	51.84640	52.38250
	(!D * RN * SN * Q)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q)	57.10650	57.23590	57.78750
	(!D * RN * !SN * Q)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q)	18.25160	18.38450	19.08360