ECE 720-001
Project #2 Report
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1. INTRODUCTION

In this report, the physical design process of a cortex_soc system is presented and analyzed; the results and data are provided at the final part. This cortex_soc system is consisted of three components, CORTEXM0DS, AHB bus and DW_memctl. The goal of this report is to minimize the clock period and number of metal layers through optimizing parameters and processes, and achieve no violations both in routing and timing.

Different physical design tools were used through this report. Cadence Encounter was employed to place and route the design and made effort to eliminate routing violations by modifying routing floorplan. Altera Modelsim was adopted to generate VCD files, which was used by Synopsys Primetime, which, in a further view, checked signal integrity and power consumption. Lastly, Cadence Encounter Power System (EPS) was used to analyze power rails.

2. PARAMETERS

Through over a hundred iterations of trial and error, the clock period was minimized from 40ns to 4.7 ns while metal layers decreased from 10 layers to 8 layers. The resulting parameters are listed below.

The first table shows data about Area while second table presents routing results. Third and forth table shows timing and signal integrity, and the following table tells clock tree details. The last table is about power integrity, and finally, final layout as well as clock tree plot and IR drop plots are provided at the end.

Number of cells (final)	Complete design area	Core design area	Cell Density
17237	157460.8 um2	97905.3 um2	31.53%

Table 1. Area and Cell Density

Number of metal layers used	Wire length
8	322278 um

Table 2. Routing results

Target clock rate	set_up slack	hold slack
4.7ns	-0.2802ns	0.0803ns

Table 3. Timing

Worst case (Above_low)			Worst case (Below_high)		
width	height	slack	width	height	slack
0.0549	0.4953	0.0003	0.6720	0.5322	-0.0216

Table 4. Signal Integrity

Max Skew	Max Insertion time	Min Insertion time	Max Transition time	Min Transition time	Number of Stages	Number of Sinks
0.0258ns	0.1201	0.0918	0.0422	0.027	5	2037

Table 5. Clock Tree Details

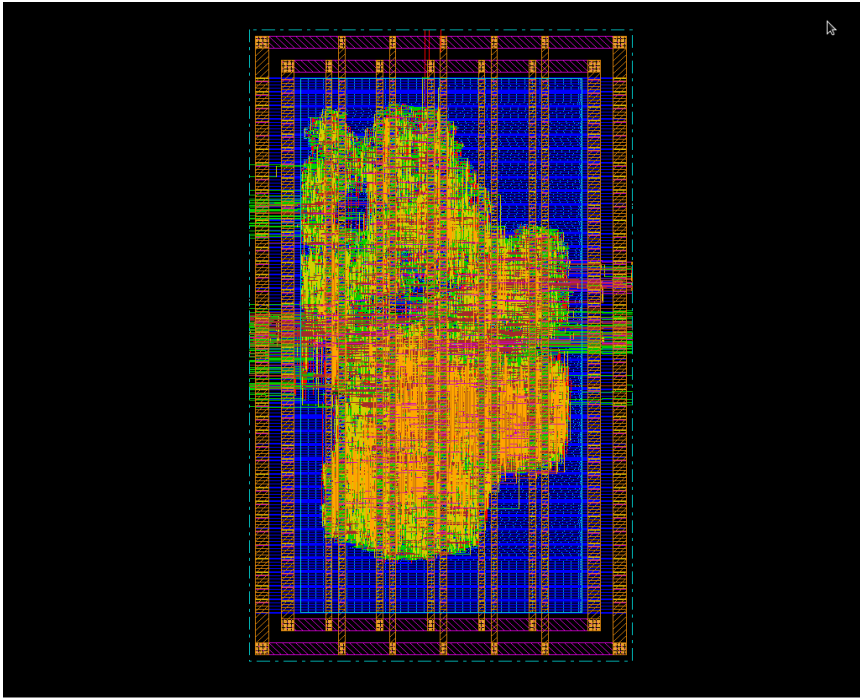| Switching Power	Internal Power	Leakage Power	Total Power	Worst Case IR Drop for VDD rails	Worst Case IR Drop for VSS rails
5.24e-03	1.94e-03	1.90e-03	9.08e-03	0.025333V	0.0239033V

Table 6. Power Integrity
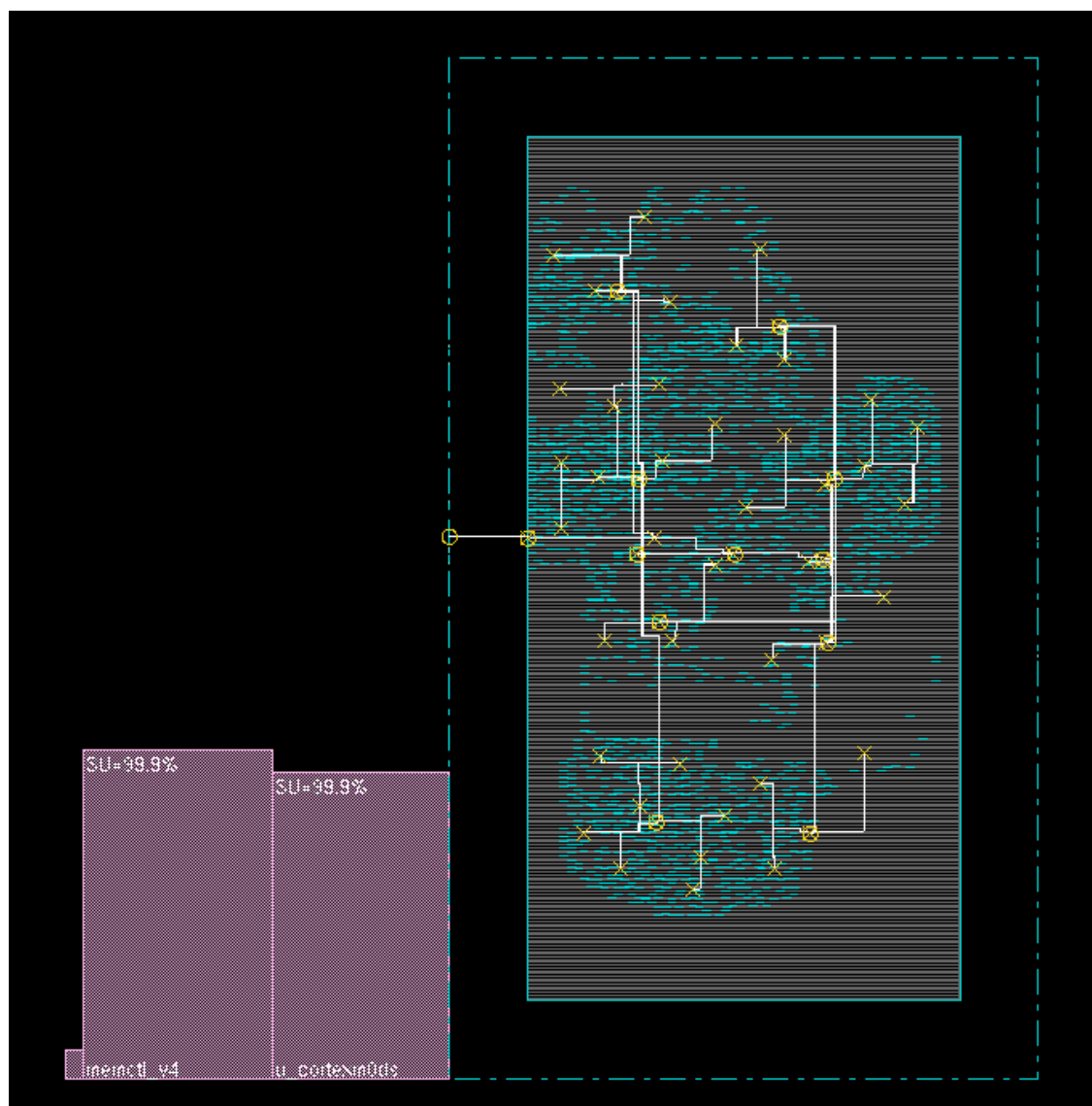

Figure 1. Final Layout

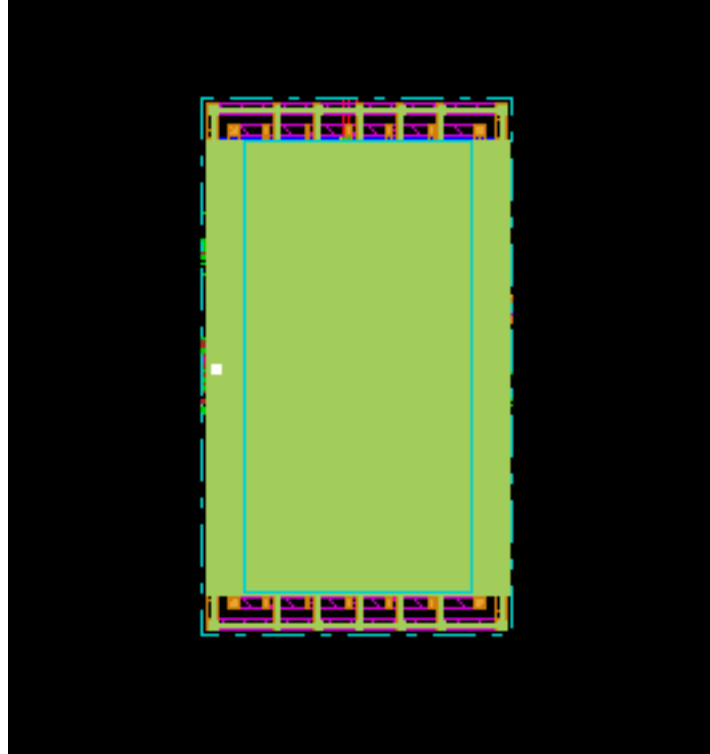Figure 2. Clock Tree Plot

Figure 3. Zoomed-Out Power & Rails Result
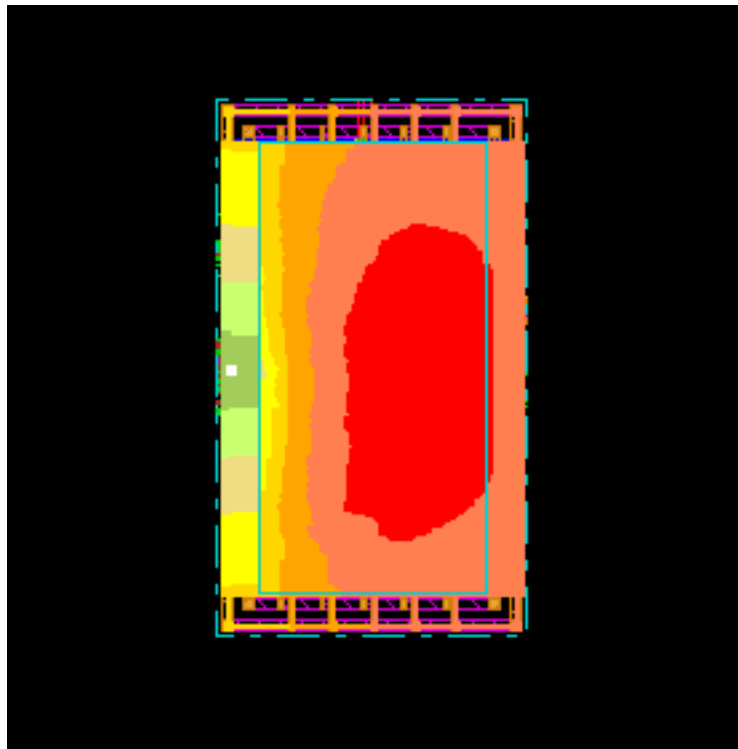
Figure 4. IR Drop for VDD
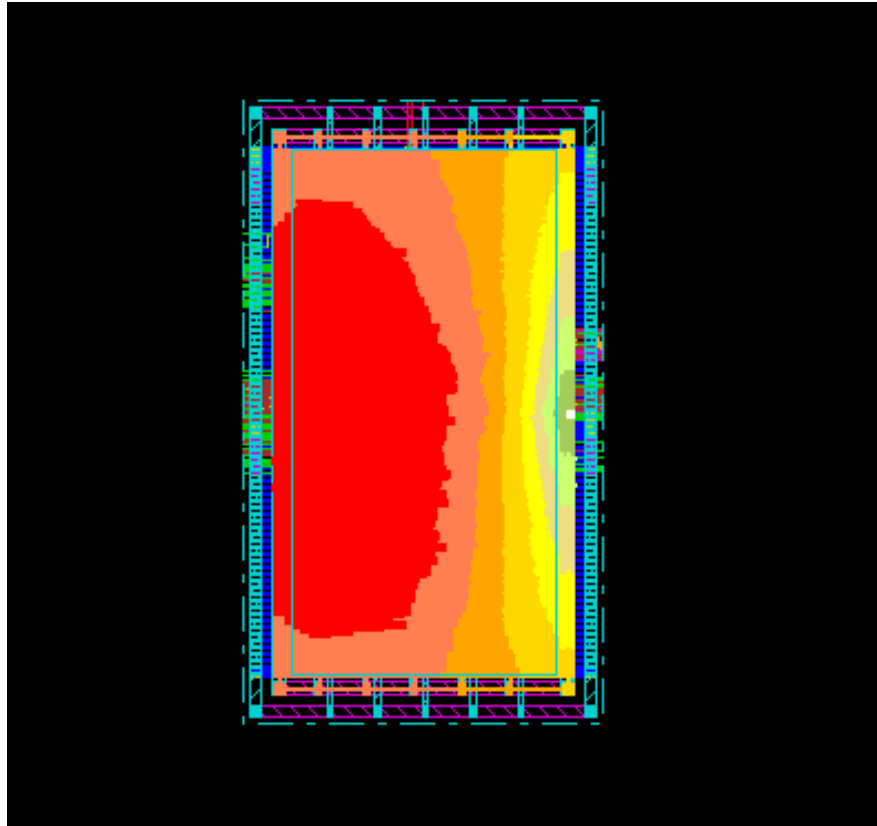
Figure 5. IR Drop for VSS

3. ITERATION RECORDS

In this report, more than 100 iterations were made to achieve project goals. The detailed data of some of these iterations are provided below.

ITER	iter1	iter2	iter3	iter4
period	40ns	30ns	30ns	25ns
Metal layer	10	10	10	10
AR	1	1	1	1
Density	0.75	0.75	0.65	0.55
Holdslack	0.15	0.15	0.15	0.15
Max skew	400ps	200ps	200ps	150ps
sink_max_tran	300ps	300ps	300ps	200ps
buf_max_tran	300ps	300ps	300ps	200ps
type	routed	routed	routed	routed
routed density	89.48%	89.48%	81.07%	69.12%
Viol/overflow	0.20% H and 3.43% V	0.20% H and 3.43% V	0.02% H and 1.76% V	0.00% H and 0.30% V
repeaterMinL	0.95	0.95	0.95	0.95
Margin	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40

Max insertion	0.129	0.129	0.1576	0.1292
Min insertion	0.0788	0.0788	0.1071	0.0862
Max tran	0.0414	0.0414	0.04	0.0348
Min tran	0.0302	0.0302	0.0292	0.0233
HOLD VIOL	-0.0132ns	-0.0132ns	0.0224ns	0.0123ns
SET UP VIOL	34.3556ns	24.4022ns	24.7441ns	20.5179ns
HOLD	VIOLATED	VIOLATED	MET	MET
SETUP	MET	MET	MET	MET

iter5	iter6	iter7	iter8	iter9
30ns	20ns	15ns	15ns	10ns
10	10	10	10	10
1	1	1	1	1
0.55	0.45	0.55	0.65	0.55
0.15	0.15	0.15	0.15	0.15
200ps	100ps	100ps	150ps	150ps
250ps	150ps	200ps	250ps	250ps
250ps	150ps	200ps	250ps	250ps
routed	routed	routed	routed	routed
69.32%	56.80%	69.56%	82.50%	71.08%
0.00% H and 0.28% V	0.00% H and 0.29% V	0.00% H and 0.30% V	0.07% H and 2.34% V	0.00% H and 0.29% V
0.95	0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1211	0.2333	0.2703	0.3725	0.4074
0.0794	0.1266	0.169	0.2759	0.2671
0.0419	0.0777	0.1385	0.0946	0.0981
0.0275	0.0609	0.1087	0.0827	0.0814
0.0793ns	0.0421ns	0.1004ns	0.0747ns	0.0015ns
24.7990ns	13.8604ns	8.3696ns	7.8186ns	3.0769ns
MET	MET	MET	MET	MET
MET	MET	MET	MET	MET

iter10	iter11	iter12	iter13	iter14
10ns	10ns	6ns	5ns	6ns
10	10	10	10	10
1	1	1	1	1
0.55	0.45	0.45	0.45	0.35
0.15	0.15	0.15	0.15	0.15
100ps	100ps	100ps	100ps	100ps

200ps	200ps	200ps	200ps	200ps
200ps	200ps	200ps	200ps	200ps
routed	routed	routed	routed	routed
69.56%	58.16%	58.16%	58.26%	44.49%
0.00% H and 0.30% V	0.00% H and 0.30% V	0.00% H and 0.30% V	0.00% H and 0.27% V	0.00% H and 0.12% V
0.95	0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.2703	0.3344	0.3344	0.3303	0.2957
0.169	0.2287	0.2287	0.2154	0.1433
0.1385	0.0773	0.0773	0.0794	0.078
0.1087	0.0622	0.0622	0.0618	0.0599
0.1004ns	0.0373ns	0.0373ns	0.0661ns	-0.0750ns
3.3696ns	3.6470ns	-0.3535ns	-0.3944ns	-0.3384ns
MET	MET	MET	MET	VIOLATED
MET	MET	VIOLATED	VIOLATED	VIOLATED

iter15	iter16	iter17	iter18	iter19
5ns	5ns	5ns	5ns	5ns
10	10	10	10	10
1	1	1	1	1.3
0.35	0.35	0.35	0.25	0.25
0.15	0.15	0.15	0.15	0.15
100ps	80ps	60ps	40ps	40ps
200ps	150ps	100ps	60ps	60ps
200ps	150ps	100ps	60ps	60ps
routed	routed	routed	routed	routed
45.27%	44.42%	44.51%	31.38%	31.53%
0.00% H and 0.11% V	0.00% H and 0.11% V	0.00% H and 0.11% V	0.00% H and 0.12% V	0.00% H and 0.08% V
0.95	0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.2984	0.2458	0.244	0.1714	0.189
0.2679	0.178	0.1786	0.1107	0.1303
0.0767	0.076	0.0753	0.0679	0.0683
0.0578	0.0561	0.0567	0.0316	0.0329
0.0524ns	0.0130ns	0.0237ns	0.0481ns	0.0695ns
-0.3841ns	-0.4619ns	-0.3605ns	-0.2804ns	-0.3577ns
MET	MET	MET	MET	MET

iter21	iter22	iter24	iter25

5ns	5ns	5ns	5ns
10	10	10	10
2	2	2	2
0.25	0.15	0.15	0.1
0.15	0.15	0.15	0.15
40ps	30ps	10ps	30ps
60ps	40ps	20ps	40ps
60ps	40ps	20ps	40ps
routed	routed	routed	routed
31.38%	18.72%	18.69%	12.47%
0.00% H and 0.08% V	0.00% H and 0.08% V	0.00% H and 0.08% V	0.00% H and 0.06% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1651	0.1547	0.1238	0.137
0.1256	0.1065	0.0954	0.1014
0.0735	0.0424	0.0266	0.0487
0.0311	0.029	0.0152	0.0279
0.0496ns	0.0175ns	0.0196ns	0.0562ns
-0.2580ns	-0.6840ns	-0.7257ns	-0.4448ns
MET	MET	MET	MET

iter26	iter27	iter28	iter29
5ns	4ns	3ns	2ns
10	10	10	10
2	2	2	2
0.05	0.25	0.25	0.25
0.15	0.15	0.15	0.15
30ps	40ps	40ps	40ps
40ps	60ps	60ps	60ps
40ps	60ps	60ps	60ps
routed	routed	routed	routed
6.25%	31.72%	31.96%	33.00%
0.00% H and 0.02% V	0.00% H and 0.07% V	0.00% H and 0.09% V	0.01% H and 0.28% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.152	0.1803		
0.1164	0.112		
0.044	0.0677		
0.03	0.0358		
0.0231ns	-0.0149ns		

-0.5352ns	-0.3019ns		
MET	VIOLATED		
VIOLATED	VIOLATED		

iter30	iter31	layer9	iter32
1ns	4ns	4.5ns	4ns
10	10	9	8
2	2	2	2
0.25	0.25	0.25	0.1
0.15	0.15	0.15	0.2
40ps	80ps	60ps	40ps
60ps	100ps	90ps	60ps
60ps	100ps	90ps	60ps
routed	routed	routed	routed
38.30%	32.06%	31.72%	14.15%
0.13% H and 1.77% V	0.00% H and 0.07% V	0.00% H and 0.02% V	0.00% H and 0.07% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1779	0.2312	0.2304	0.1904
0.1212	0.1846	0.1232	0.1176
0.0707	0.0783	0.0777	0.0672
0.0325	0.0558	0.054	0.0302
-0.3645ns	-0.0111ns	0.0562ns	0.0830ns
-2.0422ns	-0.3128ns	-0.2540ns	-0.2746ns
VIOLATED	VIOLATED	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

iter33	iter34	iter35	iter36
4ns	4ns	4ns	4ns
8	8	8	8
1	2	2	2
0.1	0.1	0.05	0.35
0.2	0.15	0.2	0.2
40ps	40ps	20ps	40ps
60ps	60ps	30ps	60ps
60ps	60ps	30ps	60ps
routed	routed	routed	routed
14.19%	12.66%	7.05%	49.22%
0.00% H and 0.04% V	0.00% H and 0.06% V	0.00% H and 0.02% V	0.00% H and 0.28% V
0.95	0.95	0.95	0.95

40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
			0.1543
			0.1062
			0.0734
			0.0294
			0.0770ns
			-0.6661ns
			MET
			VIOLATED
Crashed	Crashed	Crashed	

iter37	iter38	iter38	iter39
4ns	4ns	4ns	4ns
8	8	8	8
2	2	2	2
0.25	0.15	0.18	0.26
0.2	0.2	0.2	0.2
40ps	40ps	40ps	40ps
60ps	60ps	60ps	60ps
60ps	60ps	60ps	60ps
routed	routed	routed	routed
35.39%	21.32%	25.51%	36.68%
0.00% H and 0.08% V	0.00% H and 0.08% V	0.00% H and 0.05% V	0.00% H and 0.06% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1871		0.1812	0.1802
0.1084		0.1512	0.1375
0.0695		0.0682	0.0708
0.0358		0.0404	0.0348
0.0557ns		0.1080ns	0.0663ns
-0.2858ns		-0.3259ns	-0.5146ns
MET		MET	MET
VIOLATED		VIOLATED	VIOLATED
	Crashed		

iter40	iter41	iter42	iter43
4ns	4ns	4ns	4ns
8	8	8	8
2.5	2	2	2
0.25	0.25	0.25	0.25
0.2	0.2	0.2	0.2

40ps	40ps	30ps	50ps
60ps	60ps	45ps	75ps
60ps	60ps	45ps	75ps
routed	routed	routed	routed
35.23%	35.39%	35.39%	35.53%
0.00% H and 0.09% V	0.00% H and 0.08% V	0.00% H and 0.07% V	0.00% H and 0.07% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1584	0.1871	0.1622	0.1987
0.1079	0.1084	0.0949	0.1539
0.0677	0.0695	0.0478	0.0777
0.0316	0.0358	0.0243	0.056
0.0512ns	0.0557ns	0.0706ns	0.0952ns
-0.3507ns	-0.2858ns	-0.2617ns	-0.3663ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

iter44	iter45	iter46	iter47
4.5ns	4.5ns	4.5ns	4.5ns
8	8	8	8
2	2	2	2
0.25	0.25	0.25	0.25
0.2	0.2	0.2	0.2
40ps	30ps	50ps	50ps
60ps	45ps	75ps	60ps
60ps	45ps	75ps	60ps
routed	routed	routed	routed
35.17%	34.93%	35.30%	35.18%
0.00% H and 0.06% V	0.00% H and 0.07% V	0.00% H and 0.08% V	0.00% H and 0.08% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1611	0.1152	0.202	0.1593
0.1113	0.0902	0.1357	0.1042
0.0739	0.0419	0.077	0.0714
0.0301	0.0249	0.0512	0.0318
0.0989ns	-0.0079ns	0.1055ns	0.0861ns
-0.4025ns	-0.3255ns	-0.2589ns	-0.3305ns
MET	VIOLATED	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

		Routing Viol	

iter48	iter49	iter50	iter51
4.5ns	4.4ns	4.5ns	4.6ns
8	8	8	8
2	2	2	2
0.25	0.25	0.25	0.25
0.15	0.2	0.13	0.15
40ps	50ps	40ps	40ps
60ps	60ps	60ps	70ps
60ps	60ps	60ps	70ps
routed	routed	routed	routed
31.45%	35.18%	29.89%	31.67%
0.00% H and 0.07% V	0.00% H and 0.08% V	0.00% H and 0.06% V	0.00% H and 0.08% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1553	0.1593	0.1657	0.2029
0.1107	0.1042	0.117	0.1447
0.0691	0.0714	0.0686	0.0791
0.0309	0.0318	0.0305	0.0572
0.0178ns	0.0793ns	0.0409ns	0.0354ns
-0.2211ns	-0.4303ns	-0.2995ns	-0.1812ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

iter52	iter53	iter54	iter55
4.5ns	4.5ns	4.5ns	4.5ns
8	8	8	8
2	1.5	1	0.5
0.25	0.25	0.25	0.25
0.15	0.15	0.15	0.15
40ps	40ps	40ps	40ps
60ps	60ps	60ps	60ps
60ps	60ps	60ps	60ps
routed	routed	routed	routed
31.45%	31.54%	31.53%	31.27%
0.00% H and 0.07% V	0.00% H and 0.09% V	0.00% H and 0.12% V	0.00% H and 0.06% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40

0.1553		0.1835	0.1505
0.1107		0.1288	0.1139
0.0691		0.0727	0.0673
0.0309		0.0325	0.0302
0.0178ns		0.0313ns	0.0613ns
-0.2211ns		-0.3834ns	-0.5274ns
MET		MET	MET
VIOLATED		VIOLATED	VIOLATED
	Crashed	Routing Viol	Routing Viol

iter56	iter57	iter58	iter59
4.5ns	4.5ns	4.5ns	4.5ns
8	7	7	7
0.5	2	2	2
0.25	0.2	0.2	0.15
0.15	0.15	0.15	0.15
40ps	40ps	30ps	30ps
60ps	60ps	45ps	45ps
60ps	60ps	45ps	45ps
routed	routed	routed	routed
31.27%	25.22%	24.97%	18.72%
0.00% H and 0.06% V	0.00% H and 0.09% V	0.00% H and 0.07% V	0.00% H and 0.09% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1505	0.194	0.1352	0.1576
0.1139	0.1346	0.1125	0.107
0.0673	0.0681	0.0412	0.0419
0.0302	0.0306	0.0276	0.0292
0.0613ns	-0.0700ns	0.0230ns	0.0041ns
-0.5274ns	-0.7962ns	-0.7039ns	-0.8890ns
MET	VIOLATED	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
Routing Viol	Routing Viol	Routing Viol	Routing Viol

iter60	60cf4	iter61	iter62
4.5ns	4.5ns	4.7ns	4.5ns
7	7	7	7
2	2	2	2
0.25	0.25	0.2	0.3
0.15	0.15	0.15	0.15

30ps	30ps	30ps	30ps
45ps	45ps	45ps	45ps
45ps	45ps	45ps	45ps
routed	routed	routed	routed
31.20%	31.35%	24.97%	37.47%
0.00% H and 0.08% V	0.00% H and 0.04% V	0.00% H and 0.07% V	0.00% H and 0.08% V
0.95	0.95	0.95	0.95
40 40 40 40	20 20 20 20	40 40 40 40	40 40 40 40
0.1137	0.1669	0.1352	0.122
0.0899	0.1055	0.1125	0.0934
0.0418	0.0466	0.0412	0.0419
0.0254	0.0293	0.0276	0.0277
0.0786ns	0.0563ns	0.0239ns	0.0209ns
-0.3067ns	-0.3179ns	-0.5039ns	-0.4795ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
Routing Viol	Routing Viol	Routing Viol	Routing Viol

iter63	iter64	iter65	iter77
4.5ns	4.5ns	4.5ns	4.5ns
7	7	7	7
2	2	2	2
0.25	0.25	0.23	0.25
0.15	0.15	0.15	0.15
25ps	25ps	28ps	30ps
45ps	40ps	45ps	45ps
45ps	40ps	45ps	45ps
routed	routed	routed	routed
31.21%	31.21%	28.75%	31.31%
0.00% H and 0.08% V	0.00% H and 0.08% V	0.00% H and 0.05% V	0.00% H and 0.03% V
0.95	0.95	0.95	0.95
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1131	0.1131		0.1577
0.0896	0.0896		0.1245
0.0418	0.0418		0.0445
0.0254	0.0254		0.0294
0.0721ns	0.0721ns		0.0230ns
-0.4030ns	-0.4030ns		-0.4212ns
MET	MET		MET
VIOLATED	VIOLATED		VIOLATED

Routing Viol	Routing Viol	Crashed	Routing Viol
iter78w0.75	iter80w0.75	iter81w0.75	iter82w0.75
4.5ns	4.5ns	4.5ns	4.5ns
7	7	7	7
2	2	2	2
0.25	0.2	0.3	0.25
0.15	0.15	0.15	0.15
30ps	30ps	30ps	25ps
45ps	45ps	45ps	45ps
45ps	45ps	45ps	45ps
routed	routed	routed	routed
31.28%	24.98%	37.69%	31.37%
0.00% H and 0.04% V	0.00% H and 0.02% V	0.00% H and 0.03% V	0.00% H and 0.04% V
0.75	0.75	0.75	0.75
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40
0.1569	0.1278	0.1509	0.1698
0.1221	0.0979	0.0989	0.098
0.0428	0.0419	0.0444	0.0444
0.0297	0.0284	0.0323	0.0292
0.0194ns	-0.0096ns	0.0230ns	0.0504ns
-0.3835ns	-0.4813ns	-0.7117ns	-0.3449ns
MET	VIOLATED	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
Routing Viol	Routing Viol	Routing Viol	Routing Viol

iter83w0.75	iter84w0.75	iter85w0.75	layer8
4.5ns	4.6ns	4.7ns	4.5ns
7	7	7	8
2	2	2	2
0.25	0.25	0.25	0.25
0.15	0.15	0.15	0.15
35ps	30ps	30ps	40ps
45ps	45ps	45ps	60ps
45ps	45ps	45ps	60ps
routed	routed	routed	routed
31.24%	31.35%	31.35%	31.54%
0.00% H and 0.05% V	0.00% H and 0.04% V	0.00% H and 0.04% V	0.00% H and 0.04% V
0.75	0.75	0.75	0.75
40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40

0.1296	0.1669	0.1669	0.1767
0.097	0.1055	0.1055	0.1148
0.0454	0.0466	0.0466	0.0692
0.0281	0.0293	0.0293	0.0315
0.0653ns	0.0563ns	0.0563ns	0.0588ns
-0.3703ns	-0.2179ns	-0.1179ns	-0.4235ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
Routing Viol	Routing Viol	Routing Viol	

layer8w0.95	layer8dskew1	layer8dskew2	s86w0.95
4.5ns	4.5ns	4.5ns	4.5ns
8	8	8	7
2	2	2	2
0.25	0.25	0.25	0.25
0.15	0.15	0.15	0.15
40ps	35ps	35ps	30ps
60ps	60ps	50ps	45ps
60ps	60ps	50ps	45ps
routed	routed	routed	routed
31.51%	31.51%	31.34%	31.35%
0.00% H and 0.03% V	0.00% H and 0.04% V	0.00% H and 0.03% V	0.00% H and 0.04% V
0.95	0.95	0.95	0.95
40 40 40 40	20 20 20 20	20 20 20 20	25 25 25 25
0.1814	0.2594	0.1384	0.1654
0.1154	0.1291	0.1048	0.1058
0.0694	0.0713	0.0455	0.0457
0.0318	0.0359	0.0293	0.0292
0.0385ns	0.0363ns	0.0833ns	0.0611ns
-0.4028ns	-0.3354ns	-0.3128ns	-0.3331ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
			Routing Viol

s86w0.95	s87w0.75	s87w0.75wf25	s87w0.75wf25
4.5ns	4.5ns	4.5ns	4.5ns
7	7	7	7
2	2	2	2
0.25	0.26	0.24	0.24
0.15	0.15	0.15	0.15
30ps	30ps	30ps	30ps

45ps	45ps	45ps	45ps
45ps	45ps	45ps	45ps
routed	routed	routed	routed
31.36%	32.55%	30.18%	30.06%
0.00% H and 0.03% V	0.00% H and 0.05% V	0.00% H and 0.05% V	0.00% H and 0.04% V
0.95	0.75	0.75	0.75
25 25 25 25	25 25 25 25	25 25 25 25	25 25 25 25
0.185	0.1297		0.1354
0.0963	0.0978		0.1071
0.0474	0.0478		0.0434
0.0311	0.0282		0.028
0.0365ns	0.0278ns		0.0235ns
-0.6225ns	-0.6398ns		-0.4832ns
MET	MET		MET
VIOLATED	VIOLATED		VIOLATED
Routing Viol	Routing Viol	Crashed	Routing Viol

s87w0.75wf25t	final1w0.75n20	final2w0.95n20	final3w0.95n20
4.5ns	4.5ns	4.5ns	4.5ns
7	8	8	8
2	2	2	2
0.25	0.25	0.25	0.25
0.15	0.15	0.15	0.15
30ps	35ps	30ps	25ps
45ps	50ps	40ps	35ps
45ps	50ps	40ps	35ps
routed	routed	routed	routed
31.30%	31.23%	31.24%	31.21%
0.00% H and 0.03% V	0.00% H and 0.02% V	0.00% H and 0.03% V	0.00% H and 0.03% V
0.75	0.75	0.95	0.95
25 25 25 25	20 20 20 20	20 20 20 20	20 20 20 20
0.143	0.1161	0.1201	0.1221
0.0858	0.0912	0.0918	0.0964
0.0489	0.0431	0.0422	0.0438
0.0291	0.0269	0.027	0.026
0.0457ns	0.0790ns	0.0965ns	0.0757ns
-0.6893ns	-0.3238ns	-0.2351ns	-0.2844ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED
Routing Viol			

final4w0.95n20	final5w0.95n20	final6w0.95n20	final6w0.95n20l
4.5ns	4.5ns	4.3ns	4.7ns
8	8	8	8
2	2	2	2
0.25	0.25	0.25	0.25
0.14	0.16	0.15	0.15
30ps	30ps	30ps	30ps
40ps	40ps	40ps	40ps
40ps	40ps	40ps	40ps
routed	routed	routed	routed
30.48%	32.18%	31.24%	31.24%
0.00% H and 0.03% V	0.00% H and 0.04% V	0.00% H and 0.03% V	0.00% H and 0.03% V
0.95	0.95	0.95	0.95
20 20 20 20	20 20 20 20	20 20 20 20	20 20 20 20
0.1199	0.1212	0.1201	0.1201
0.0913	0.0916	0.0918	0.0918
0.0423	0.0444	0.0422	0.0422
0.0267	0.0269	0.027	0.027
0.0408ns	0.0838ns	0.0965ns	0.0965ns
-0.2688ns	-0.4558ns	-0.4351ns	-0.0351ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

final8	final8s	final8s	final8s
4.7ns	4.5ns	4.5ns	4.5ns
8	8	8	8
2	1	1	1.5
0.25	0.25	0.2	0.25
0.15	0.15	0.15	0.15
30ps	30ps	25ps	30ps
40ps	40ps	40ps	40ps
40ps	40ps	40ps	40ps
routed	routed	routed	routed
31.24%	31.20%	25.04%	31.22%
0.00% H and 0.03% V	0.00% H and 0.13% V	0.00% H and 0.12% V	0.00% H and 0.06% V
0.95	0.95	0.95	0.95
4*40	4*40	4*40	4*40
0.1201	0.1611	0.1493	0.1307

0.0918	0.1112	0.1202	0.101
0.0422	0.0458	0.0416	0.0454
0.027	0.0285	0.0294	0.0272
0.0965ns	0.0165ns	0.0219ns	0.0791ns
-0.0351ns	-0.4883ns	-0.4898ns	-0.6148ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

final8	final8w1.7	final9w1.7	final10
4.7ns	4.7ns	4.7ns	4.7ns
8		8	8
2	1.7	1.7	1.7
0.25	0.25	0.25	0.25
0.15		0.15	0.15
30ps	30ps	35ps	40ps
40ps	40ps	40ps	40ps
40ps	40ps	40ps	40ps
routed	routed	routed	routed
31.53%	31.27%	31.26%	31.26%
0.00% H and 0.03% V	0.00% H and 0.03% V	0.00% H and 0.03% V	0.00% H and 0.03% V
0.95	0.95	0.95	0.95
4*40	4*40	4*40	4*40
0.1715	0.1346	0.1319	0.1319
0.1466	0.0928	0.1039	0.1039
0.0469	0.0414	0.04	0.04
0.0283	0.0299	0.0298	0.0298
0.0803ns	0.0097ns	0.0225ns	0.0225ns
-0.2802ns	-0.4890ns	-0.4635ns	-0.4635ns
MET	MET	MET	MET
VIOLATED	VIOLATED	VIOLATED	VIOLATED

do20	do25	Iter_final_run
4.7ns	4.7ns	4.7ns
8	8	8
2	2	2
0.25	0.25	0.25
0.15	0.15	0.15
20ps	25ps	30ps
30ps	30ps	40ps
30ps	30ps	40ps

routed	routed	routed
31.23%	31.23%	31.53%
0.00% H and 0.03% V	0.00% H and 0.03% V	0.00% H and 0.03% V
0.95	0.95	0.95
4*40	4*40	4*40
0.1638	0.1638	0.1715
0.0837	0.0837	0.1466
0.0398	0.0398	0.0469
0.0163	0.0163	0.0283
0.0972ns	0.0972ns	0.0803ns
-0.3048ns	-0.3048ns	-0.2802ns
MET	MET	MET
VIOLATED	VIOLATED	VIOLATED

4. SUMMARY

In this report, all the details results are provides regarding physical design of cortex_soc system. For more details, please refer to the supporting files in Github repo.