

TSEK06 High-Level Design Report

Group 5

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Version P1B

Status

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PROJECT IDENTITY

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Document history

Version	Date	Changes	Performed by
P1A	2016-02-15	First draft	Johan Isaksson

1 Introduction

2 Block Level Description

2.1 SPI/PSRBR

2.2 16-bit Kogge-Stone Adder

The Kogge-Stone adder consists of four simple blocks connected in a complex way.

Lägg till bild på hur blocken sitter ihop och förklaring om P och G signalerna.

2.2.1 Red

Table 1 – Logic table of red block.

A_i	B_i	$P = A_i \oplus B_i$	$G = A_i \wedge B_i$
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

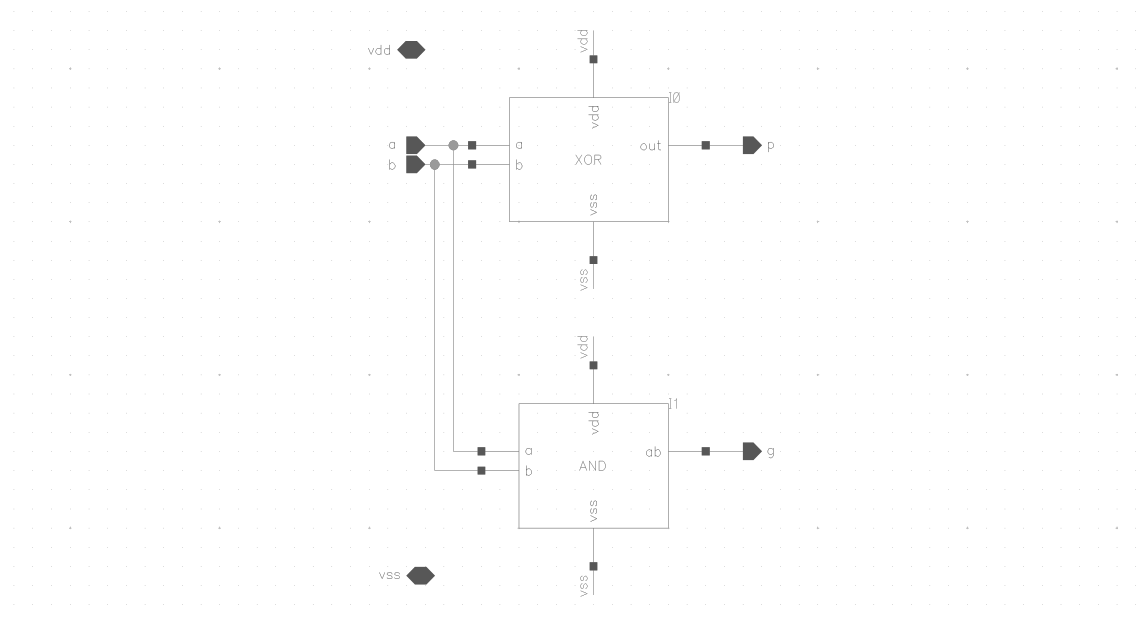
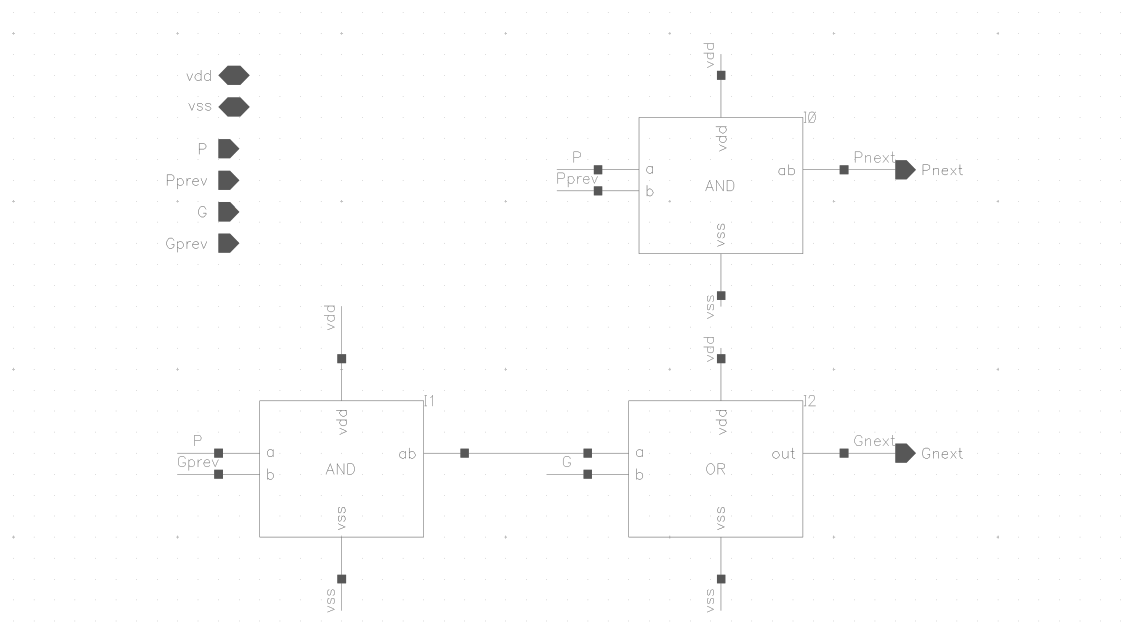


Figure 1 – Schematic view of the red block.

2.2.2 Yellow

Table 2 – Logic table of yellow block.

G_i	$G_{i,prev}$	P_i	$P_{i,prev}$	$P = P_i \wedge P_{i,prev}$	$G = (P_i \wedge G_{i,prev}) \vee G_i$
0	0	0	0	0	0
0	0	0	1	0	0
0	0	1	0	0	0
0	0	1	1	1	0
0	1	0	0	0	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	1	1
1	0	0	0	0	1
1	0	0	1	0	1
1	0	1	0	0	1
1	0	1	1	1	1
1	1	0	0	0	1
1	1	0	1	0	1
1	1	1	0	0	1
1	1	1	1	1	1

**Figure 2** – Schematic view of the yellow block.

2.2.3 Yellow with carry

Table 3 – Logic table of yellow with carry block.

P_i	G_i	$G_{i,prev}$	$G = (P_i \wedge G_{i,prev}) \vee G_i$
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

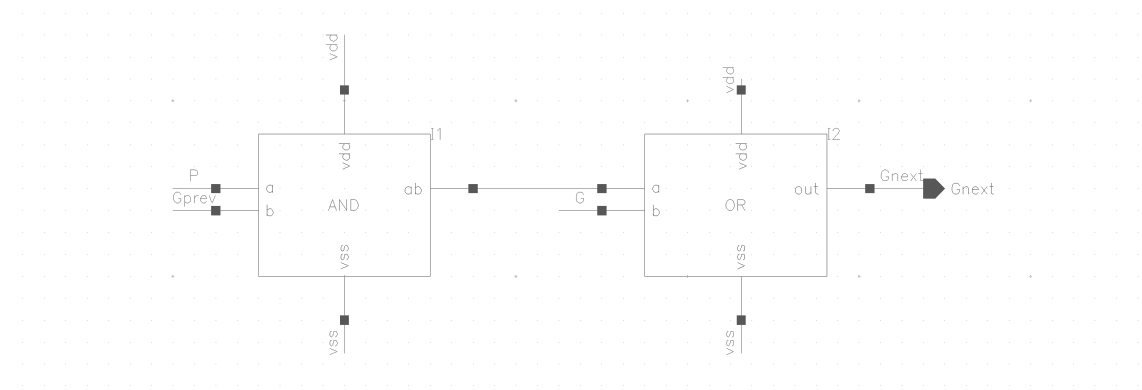


Figure 3 – Schematic view of the yellow carry block.

2.2.4 Sum

Table 4 – Logic table of sum block.

P_i	C_{i-1}	$S_i = P_i \oplus C_{i-1}$
0	0	0
0	1	1
1	0	1
1	1	0

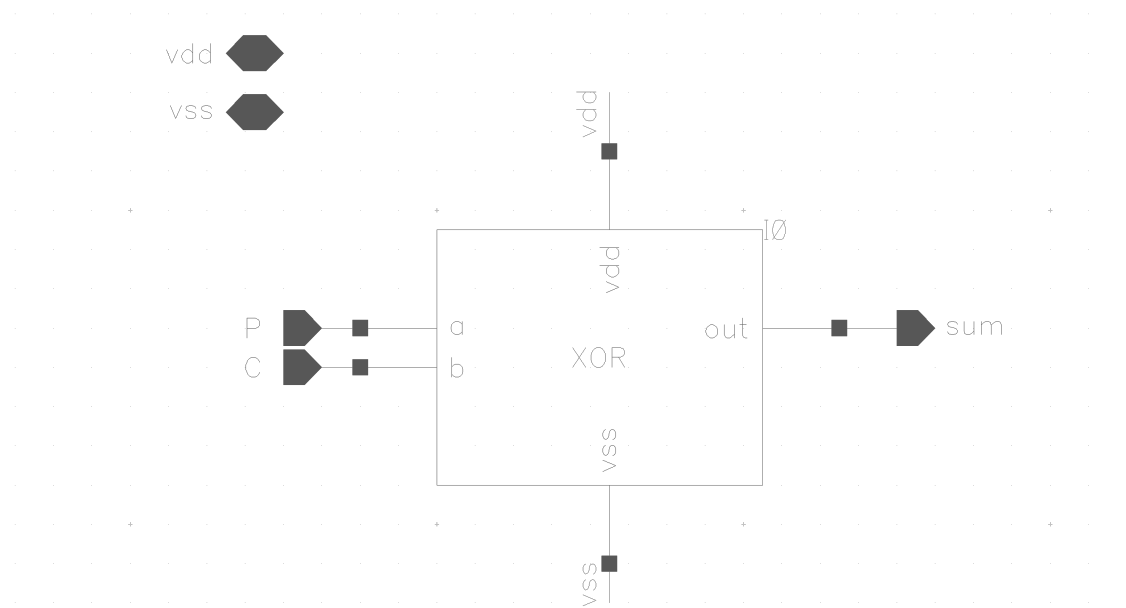


Figure 4 – Schematic view of the sum block.

2.3 Comparator