

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /

File: FetsAndCrosses.sch

Title: Fets and Crosses

Size: A3 | Date: 2020-09-15

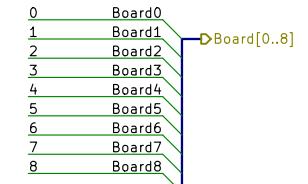
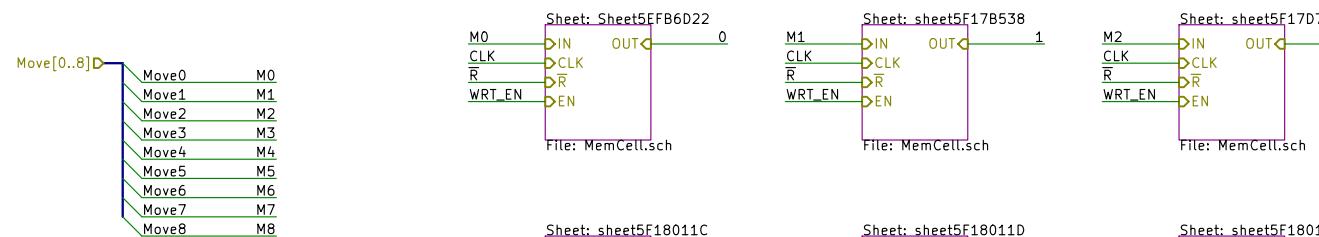
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

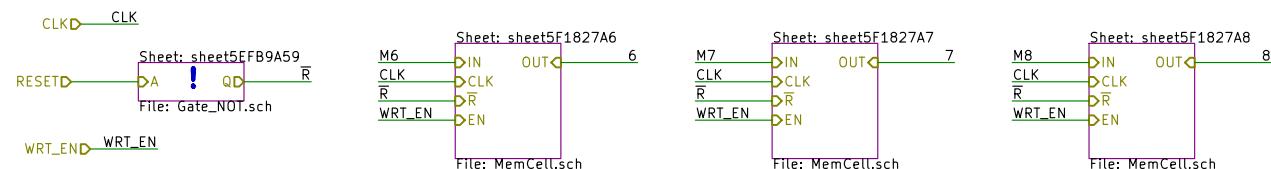
Id: 1/362

1 2 3 4 5 6

A



B



C

D

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Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/

File: PlayerMem.sch

Title: Fets and Crosses

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 2/362

1 2 3 4 5 6

A

A

B

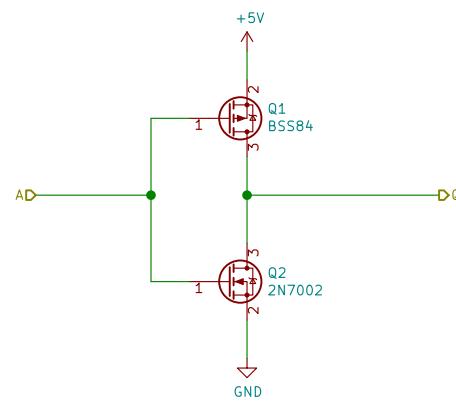
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5EFB9A59/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 3/362

A

B

C

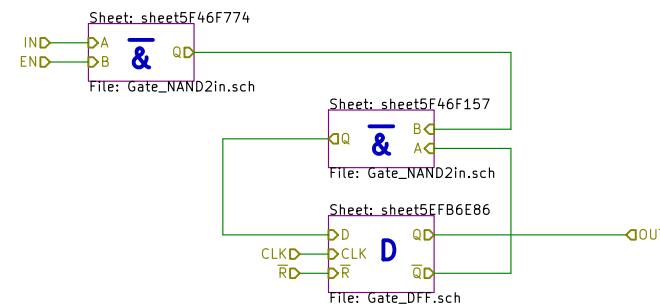
D

A

B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

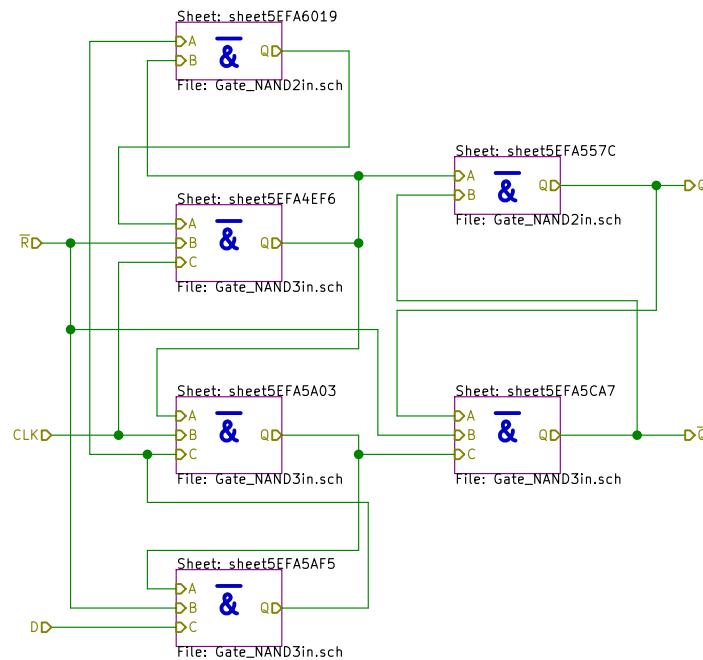
Sheet: /PlayerMem\_1/Sheet5EFA6D22/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 4/362

A



B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

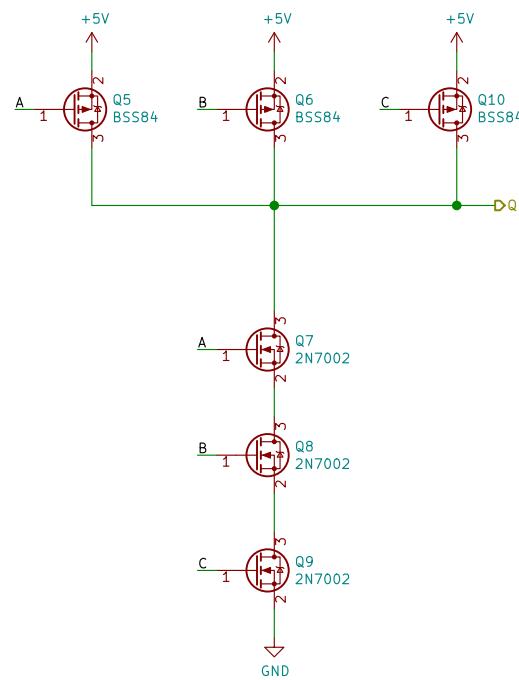
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File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 5/362

A



B

A  
B  
C

Q7 2N7002

Q8 2N7002

Q9 2N7002

GND

C

D

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Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA4EF6/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

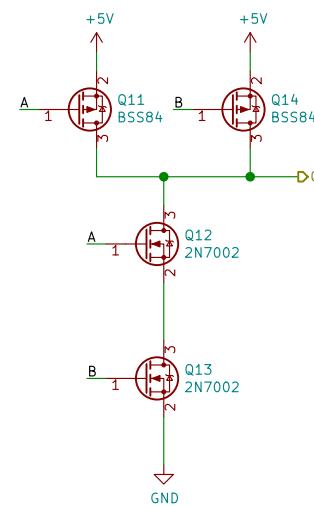
Id: 6/362

A

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 7/362

A

B

C

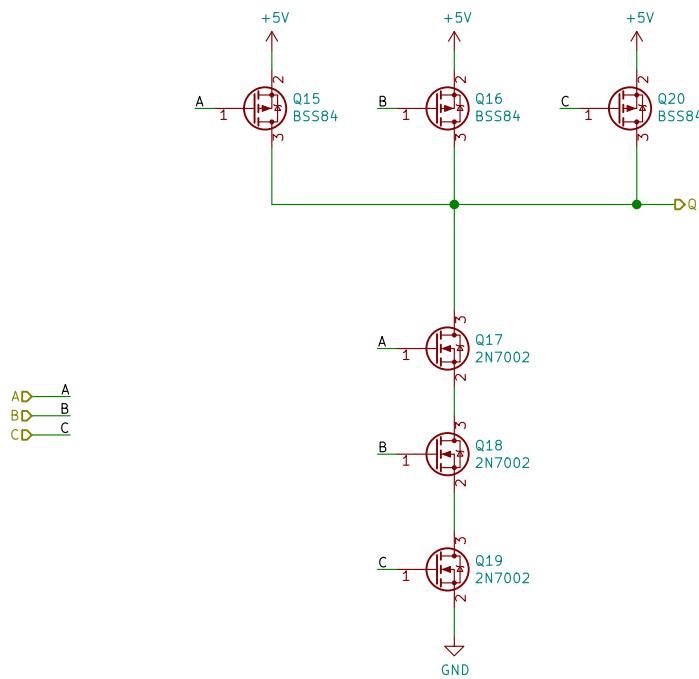
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 8/362

A

A

B

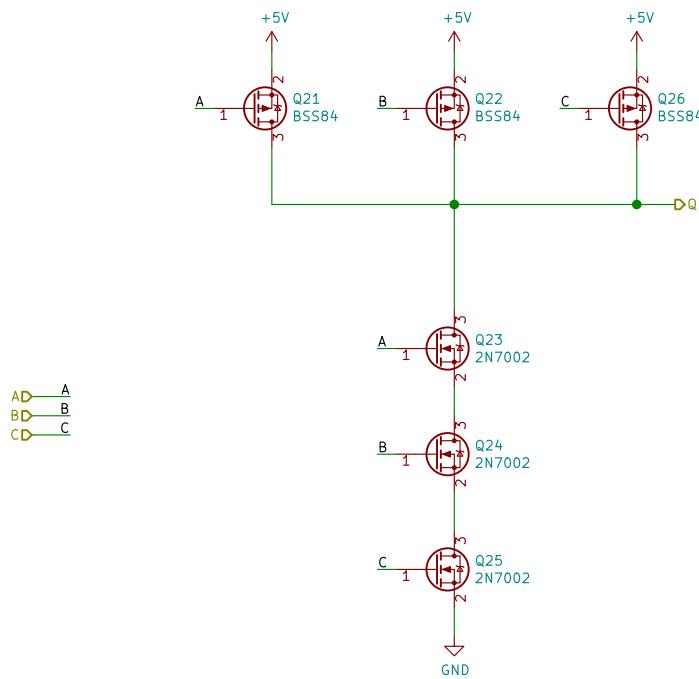
B

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C

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5AF5/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

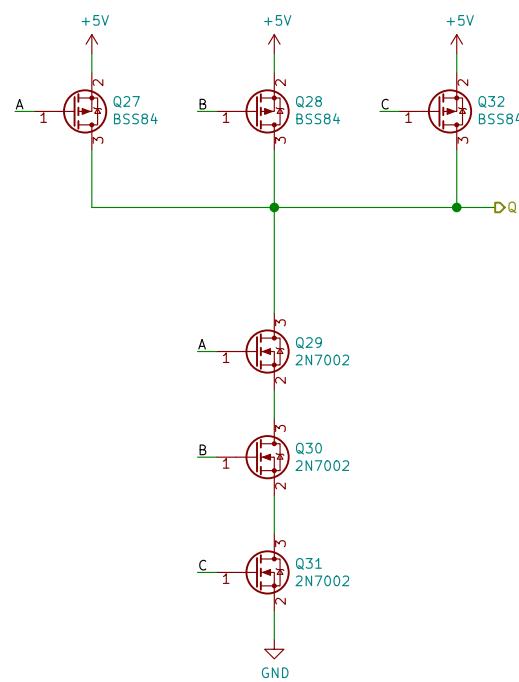
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 9/362

A



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Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

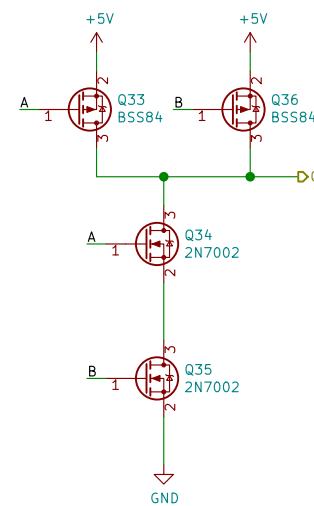
Id: 10/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA6019/  
File: Gate\_NAND2in.sch**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

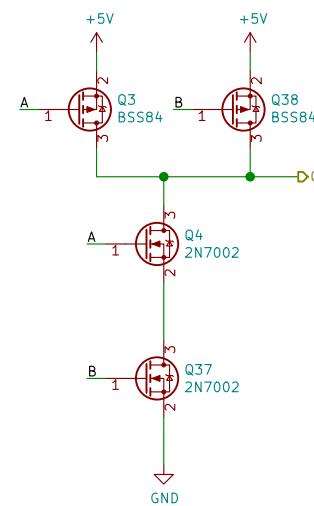
Id: 11/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

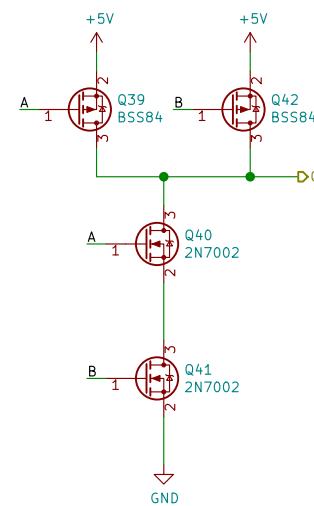
Id: 12/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/Sheet5EFB6D22/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

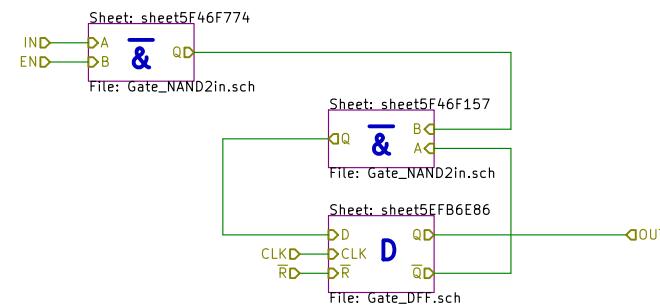
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 13/362

A



B

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D

A

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

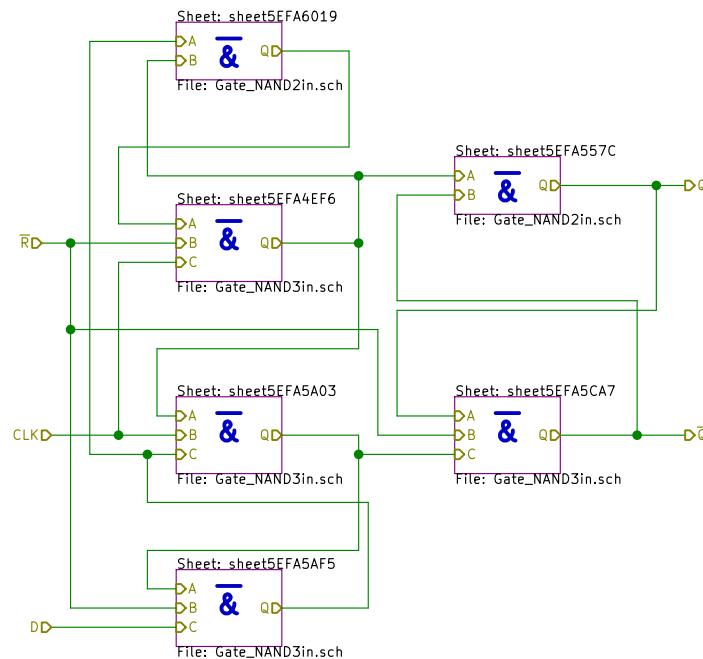
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_1/sheet5F17B538/  
 File: MemCell.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 14/362

A



B

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D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 15/362

A

A

B

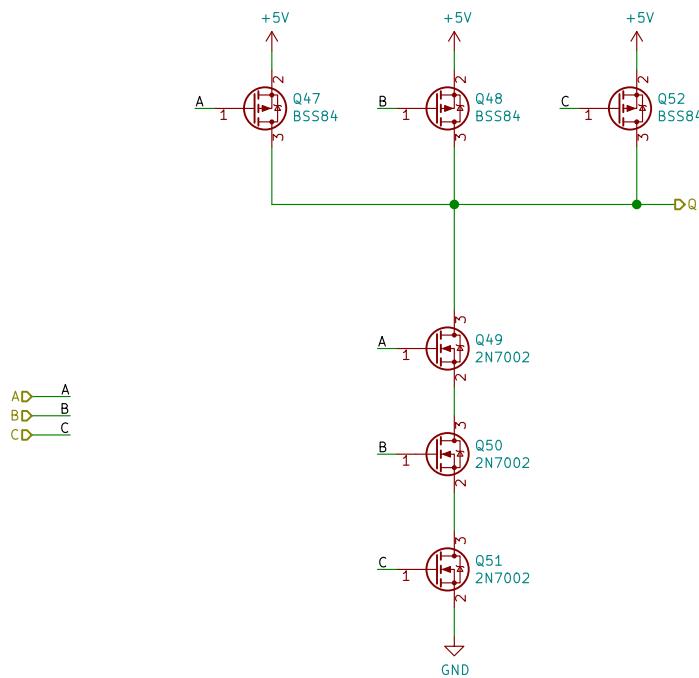
B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

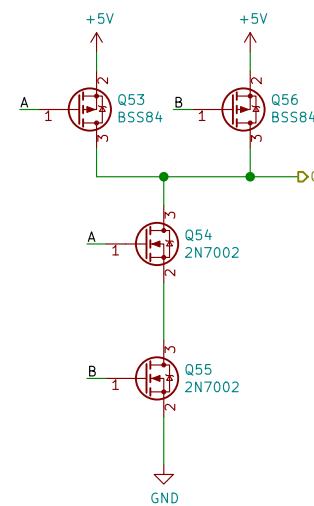
Id: 16/362

A

B

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

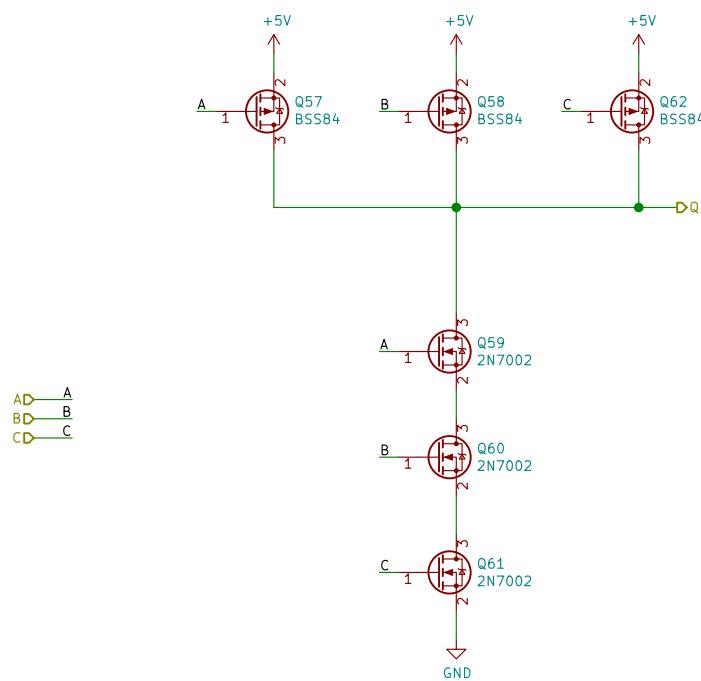
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 17/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA5A03/

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**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 18/362

A

B

C

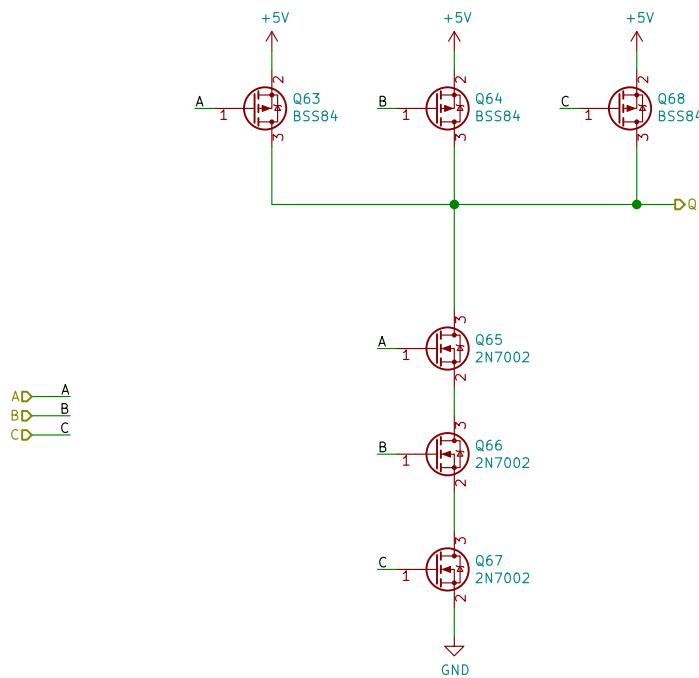
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 19/362

A

B

C

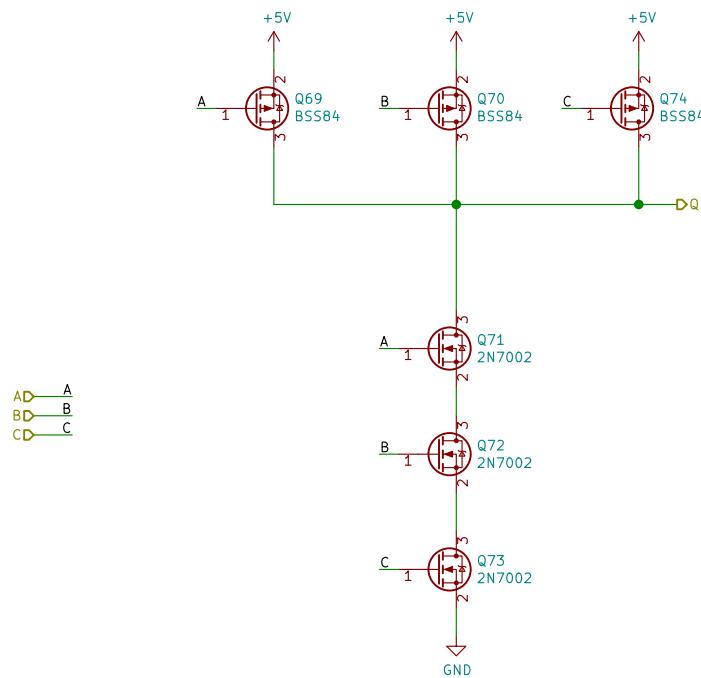
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA5CA7/

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**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

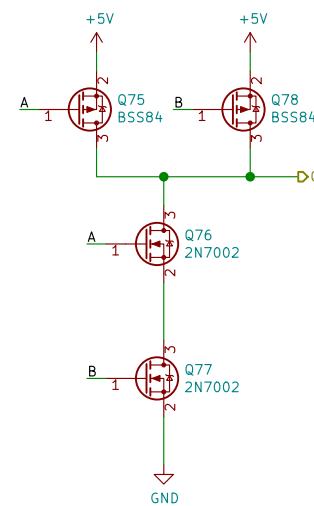
Id: 20/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5EFB6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

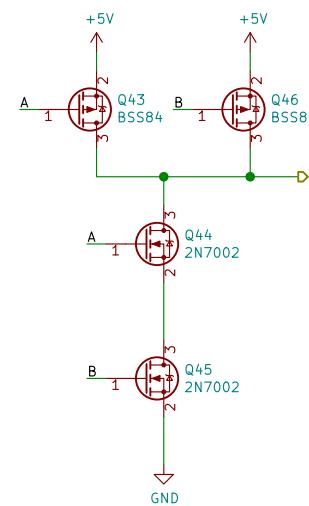
Id: 21/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

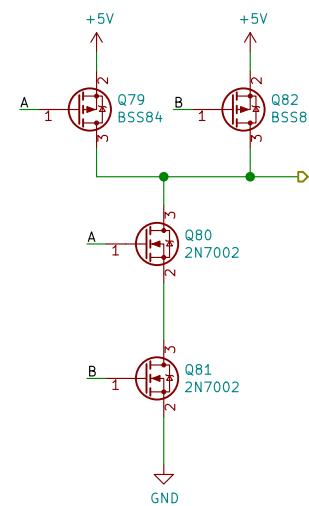
Id: 22/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17B538/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

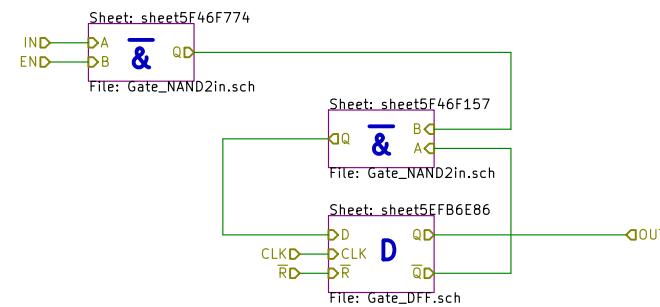
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KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 23/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

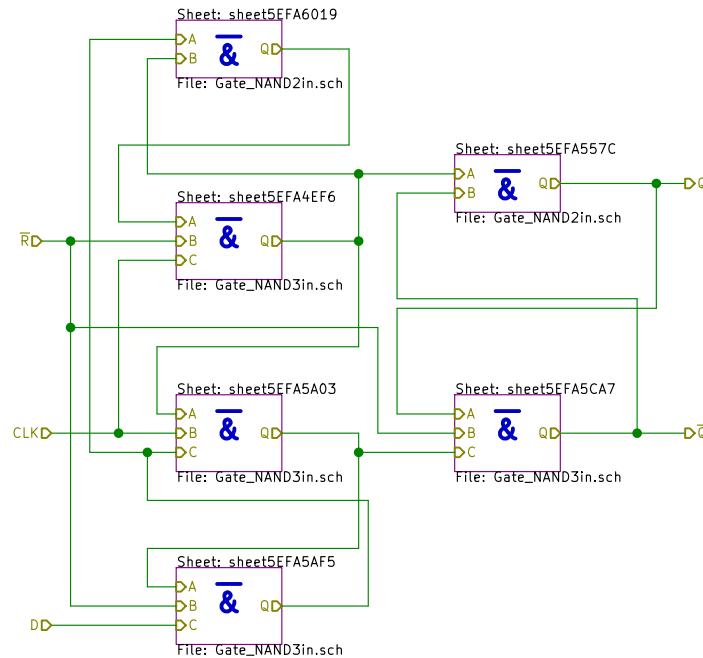
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File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 24/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 25/362

A

B

C

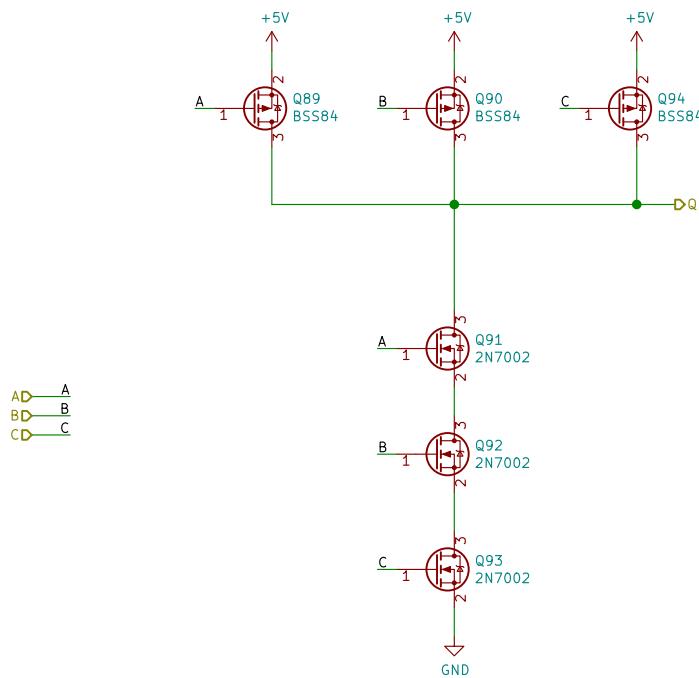
D

A

B

C

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA4EF6/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

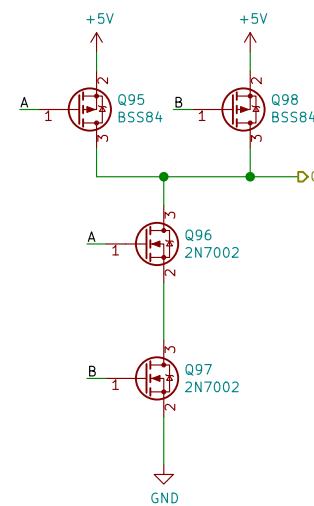
Id: 26/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 27/362

A

B

C

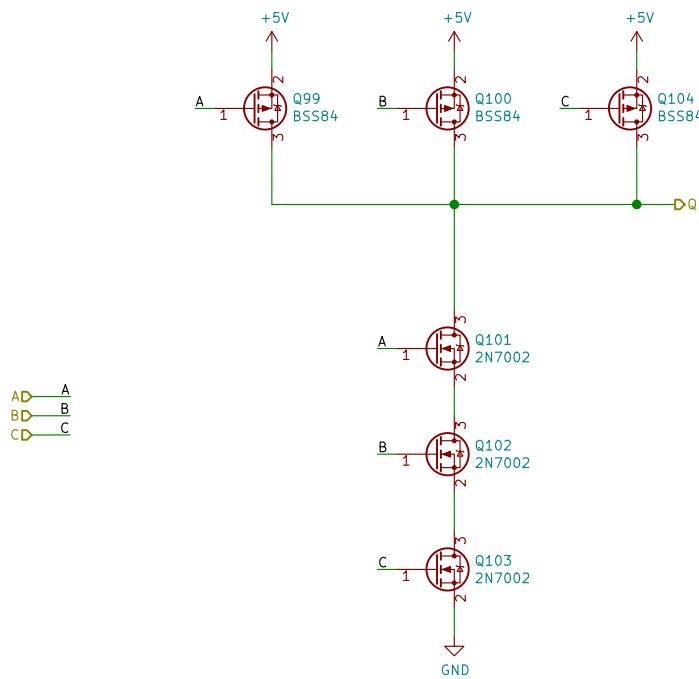
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 28/362

A

A

B

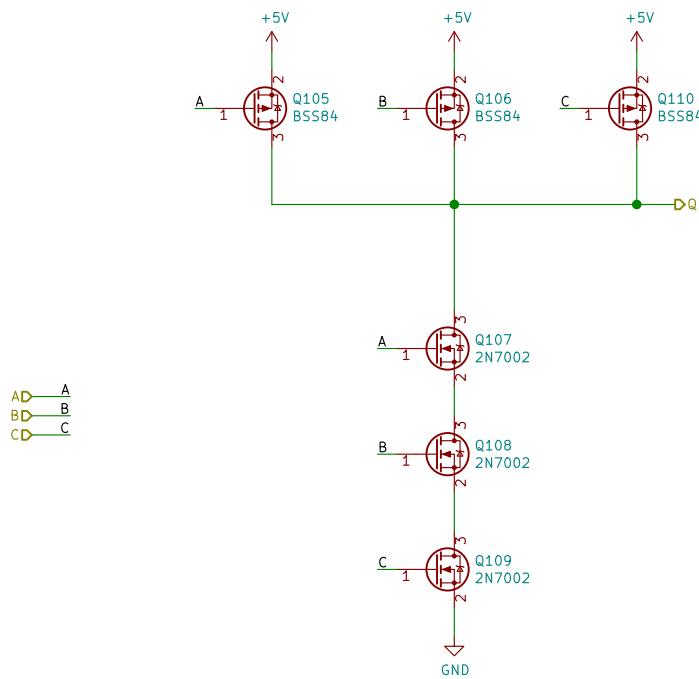
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 29/362

A

B

C

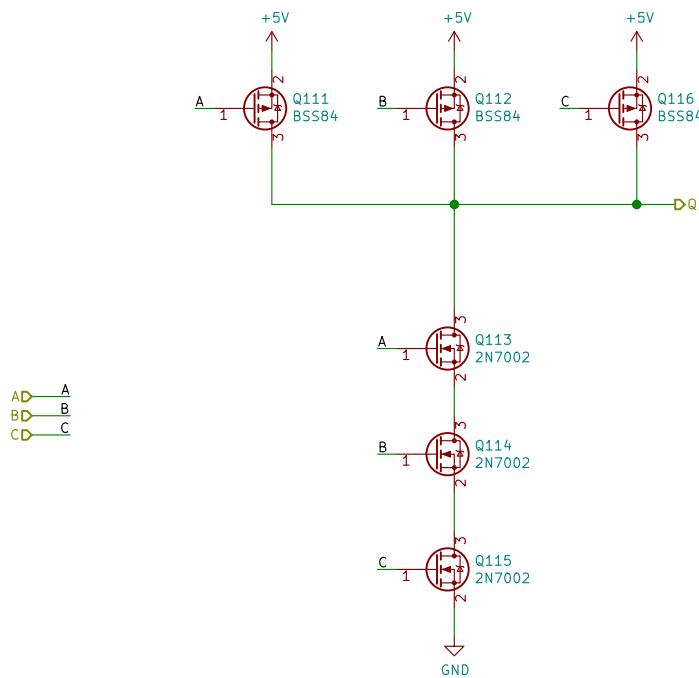
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

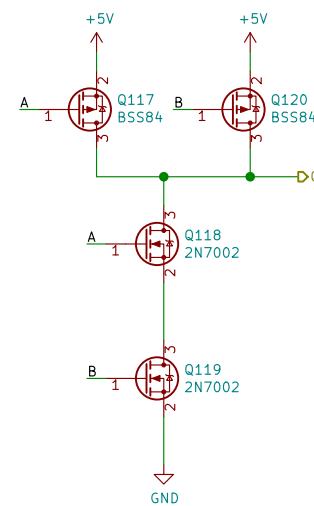
Id: 30/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5EFB6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

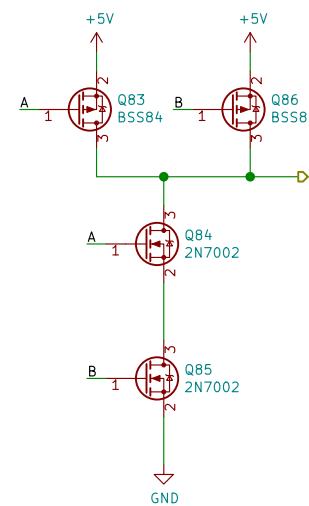
Id: 31/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

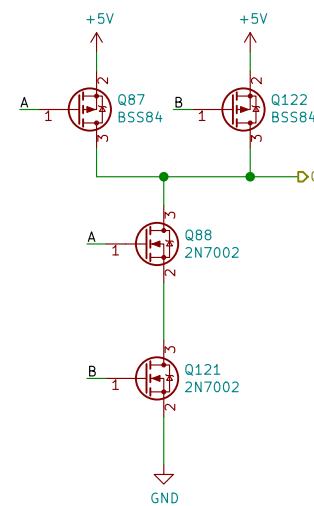
Id: 32/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F17D798/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

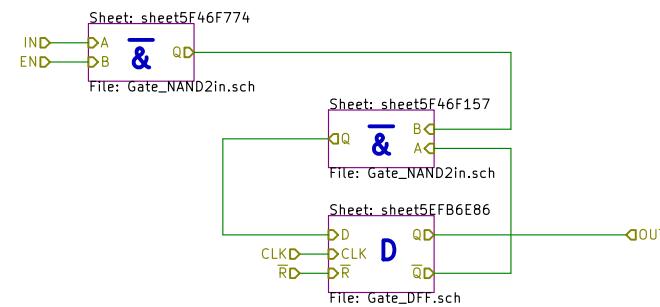
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 33/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

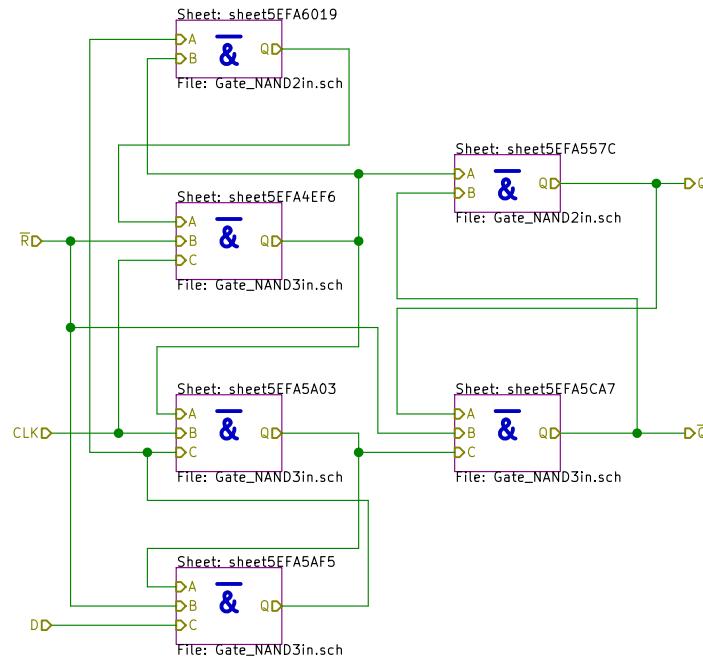
Sheet: /PlayerMem\_1/sheet5F18011C/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 34/362

A



B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 35/362

A

A

B

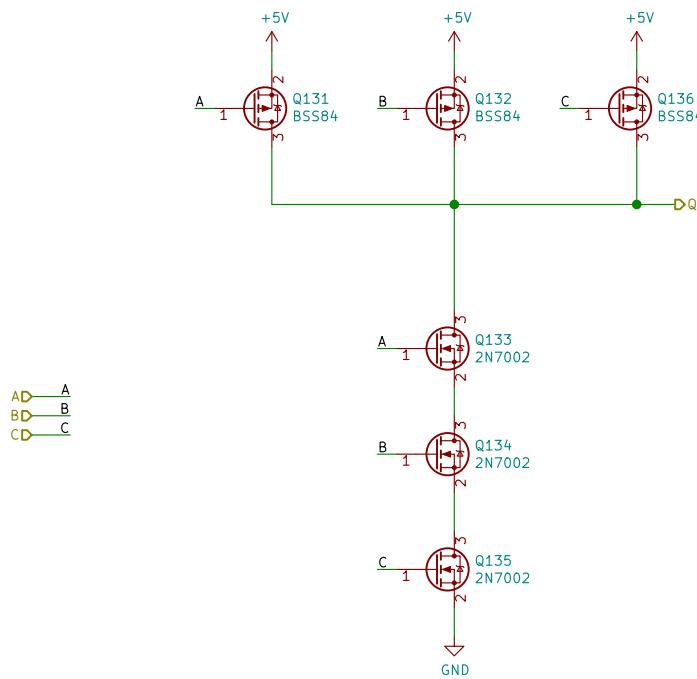
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

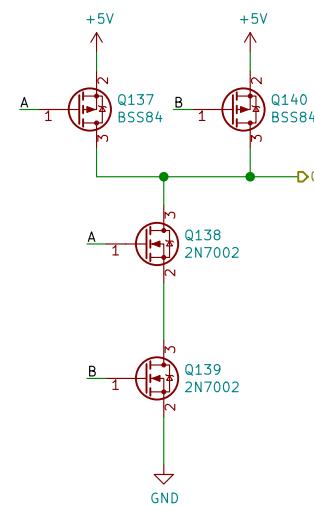
Id: 36/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5EFA557C/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 37/362

A

B

C

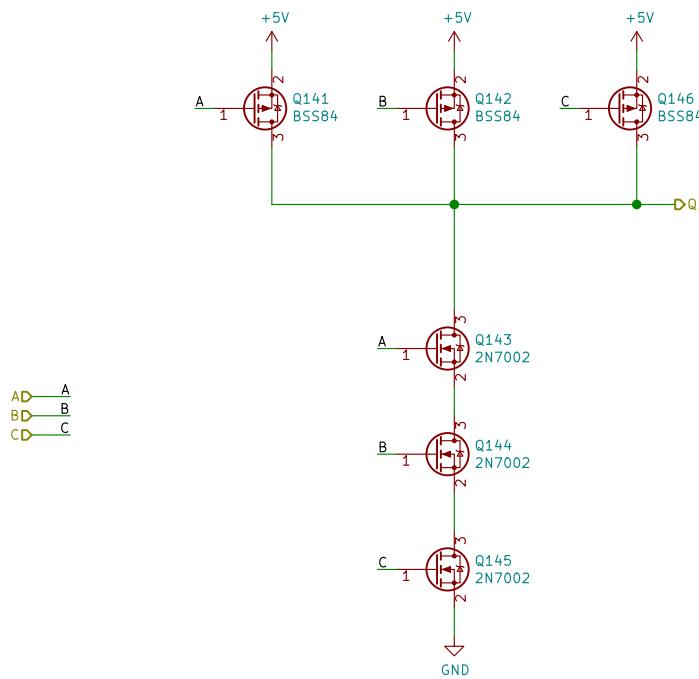
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5E86E86/sheet5EFA5A03/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 38/362

A

B

C

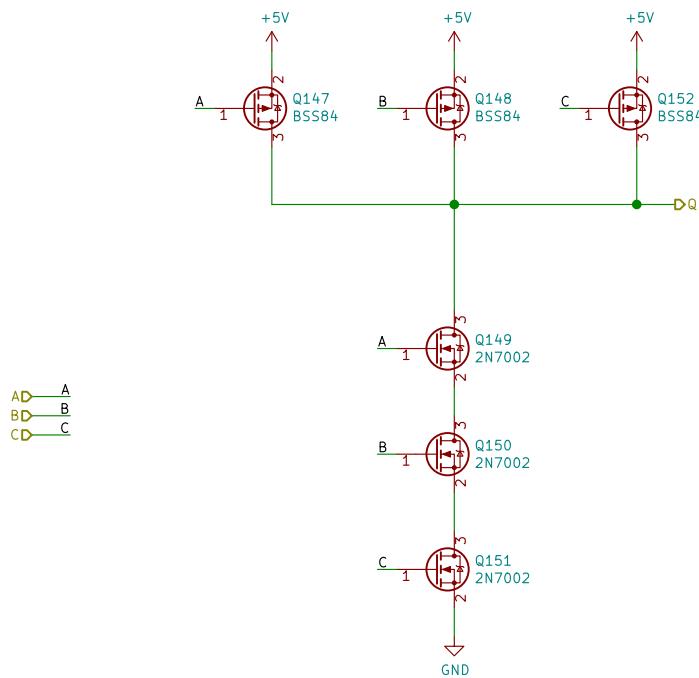
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 39/362

A

B

C

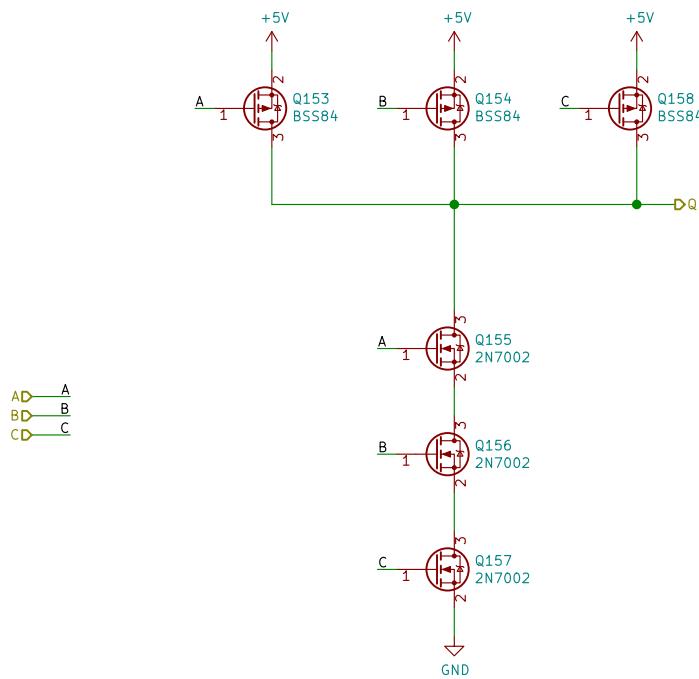
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

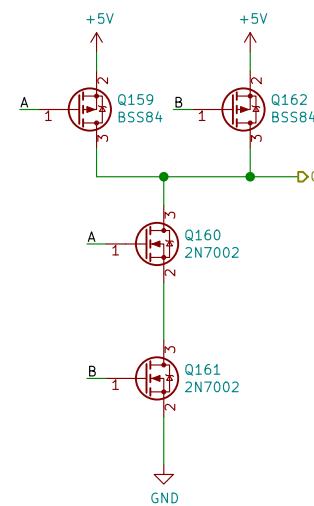
Id: 40/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5EFA6019/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

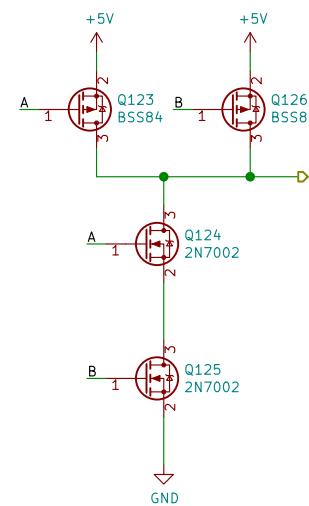
Id: 41/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

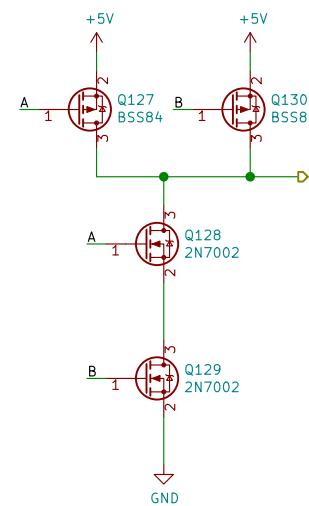
Id: 42/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011C/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

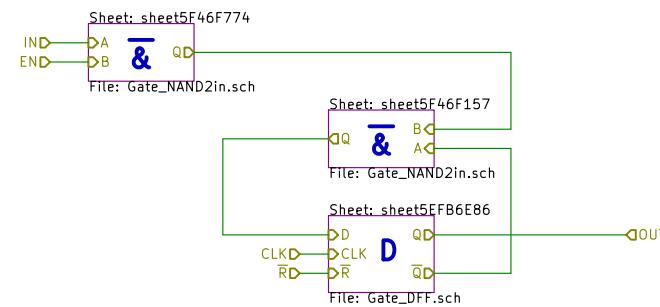
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 43/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

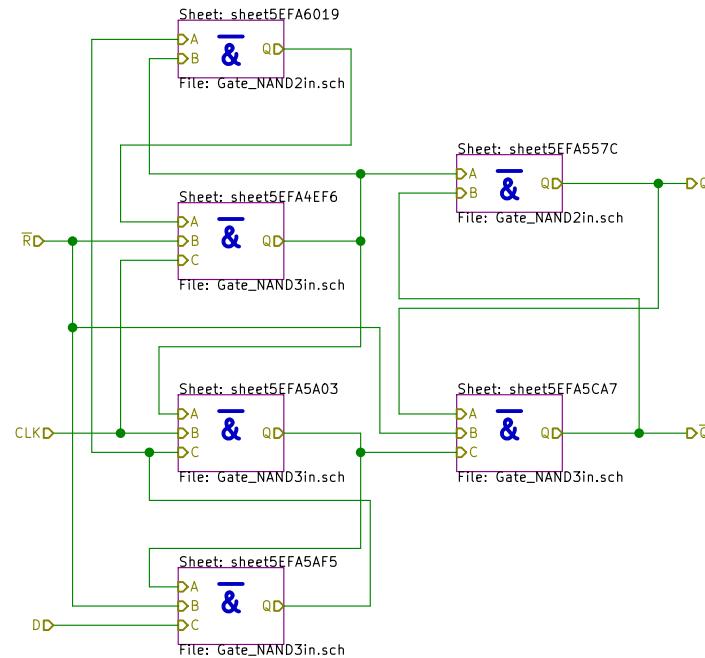
Sheet: /PlayerMem\_1/sheet5F18011D/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 44/362

A



B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 45/362

A

A

B

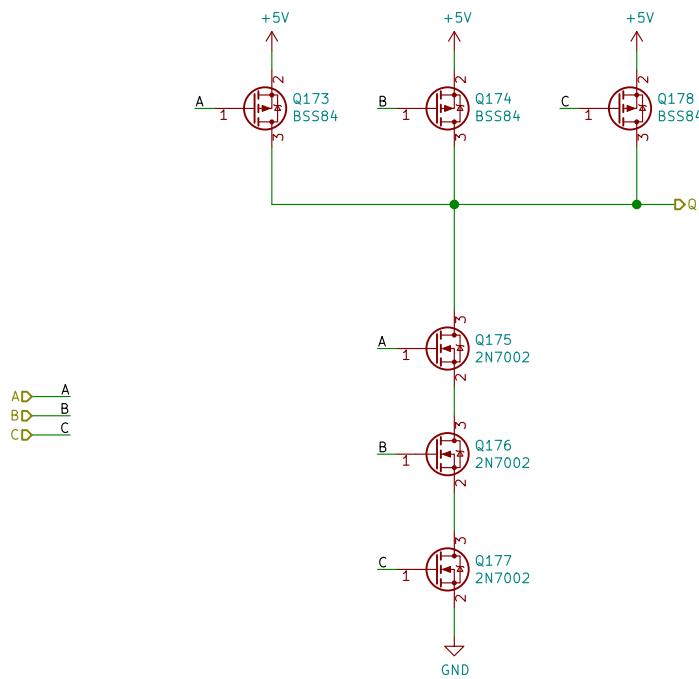
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

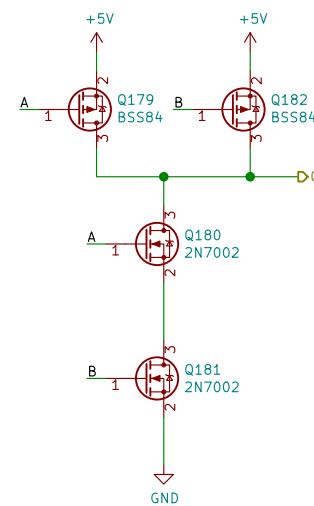
Id: 46/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5E86E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 47/362

A

B

C

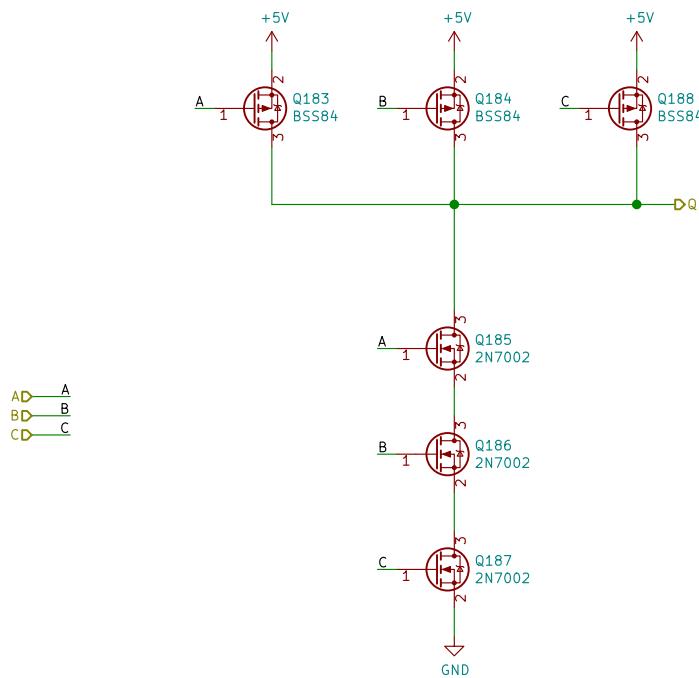
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 48/362

A

A

B

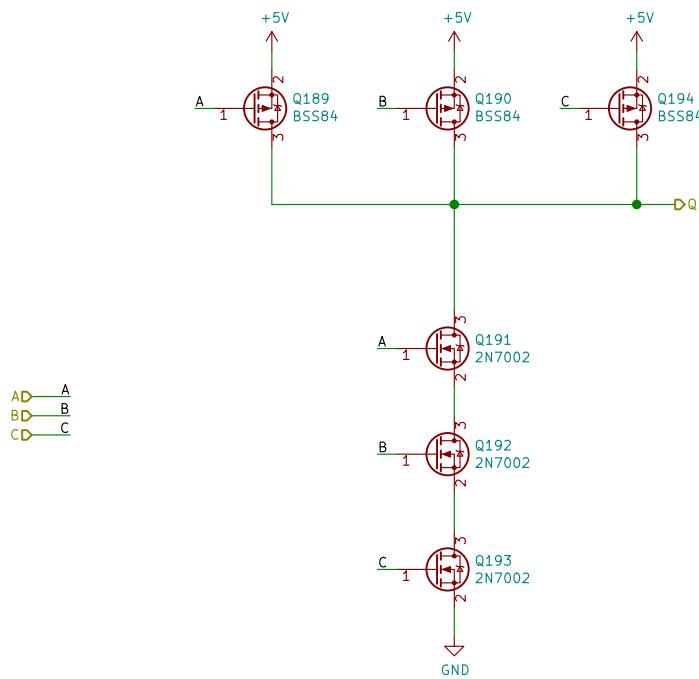
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 49/362

A

B

C

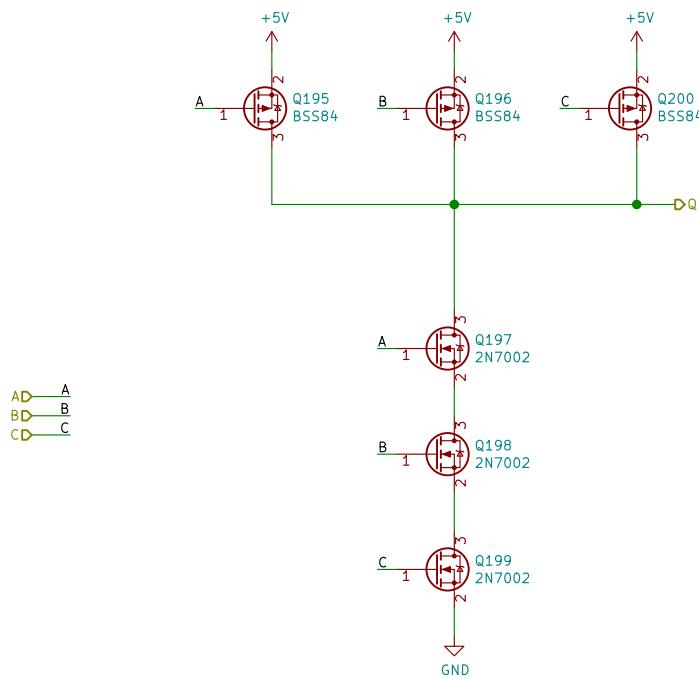
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

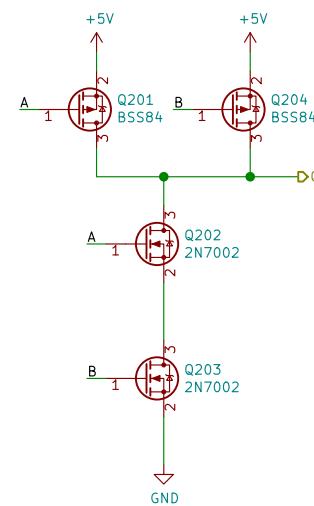
Id: 50/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5EFA6019/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

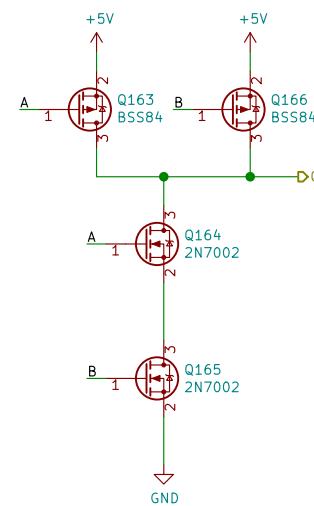
Id: 51/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

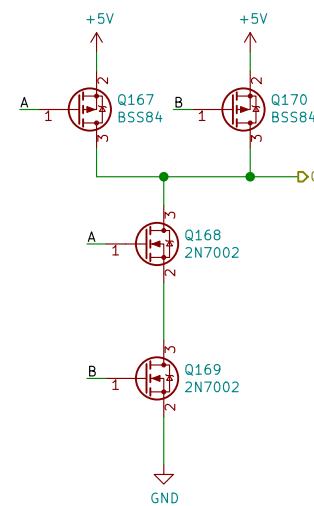
Id: 52/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011D/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

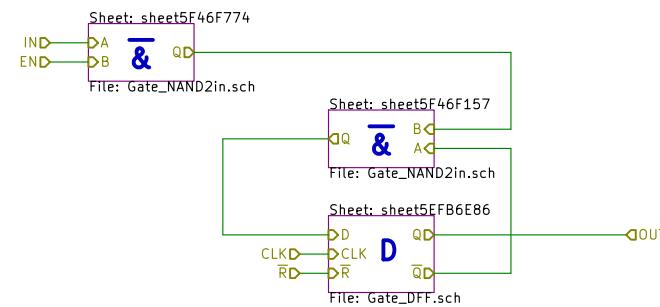
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 53/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

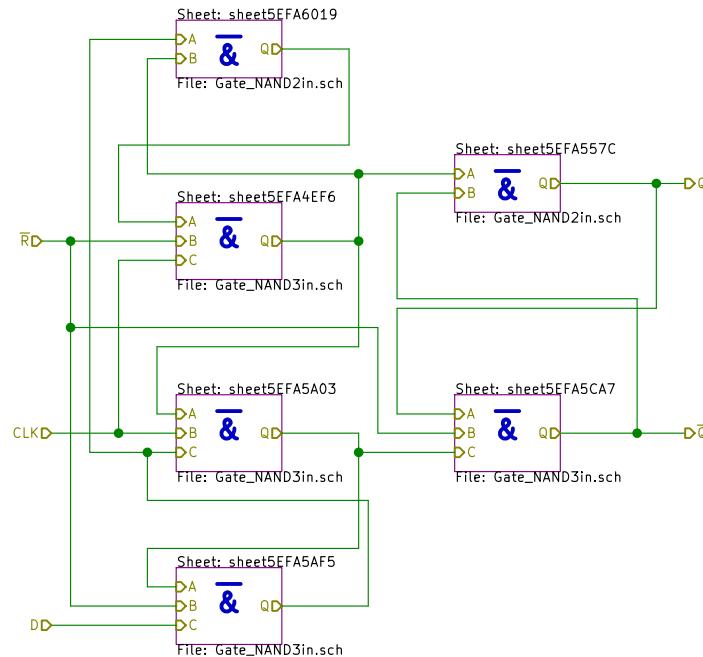
Sheet: /PlayerMem\_1/sheet5F18011E/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

<b>Rev: v0.2</b>
Id: 54/362

A



B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

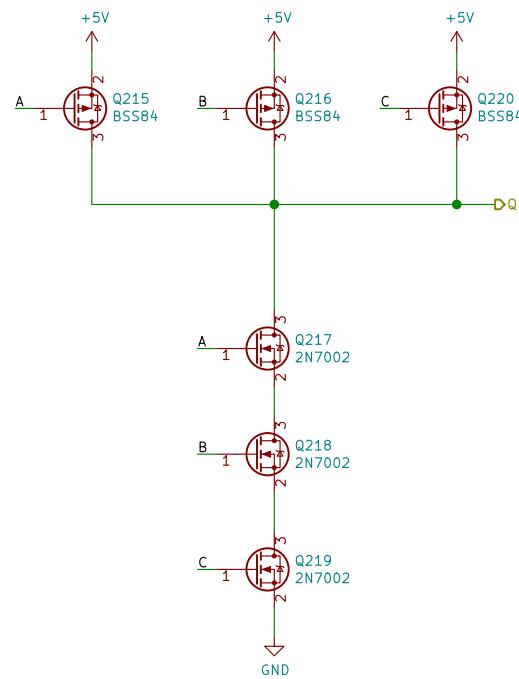
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 55/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

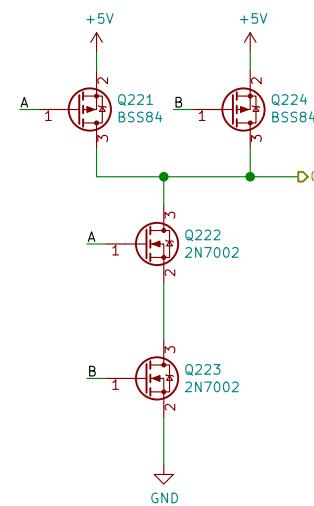
Id: 56/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_1/sheet5F18011E/sheet5E86E86/sheet5EFA557C/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

Id: 57/362
------------

A

B

C

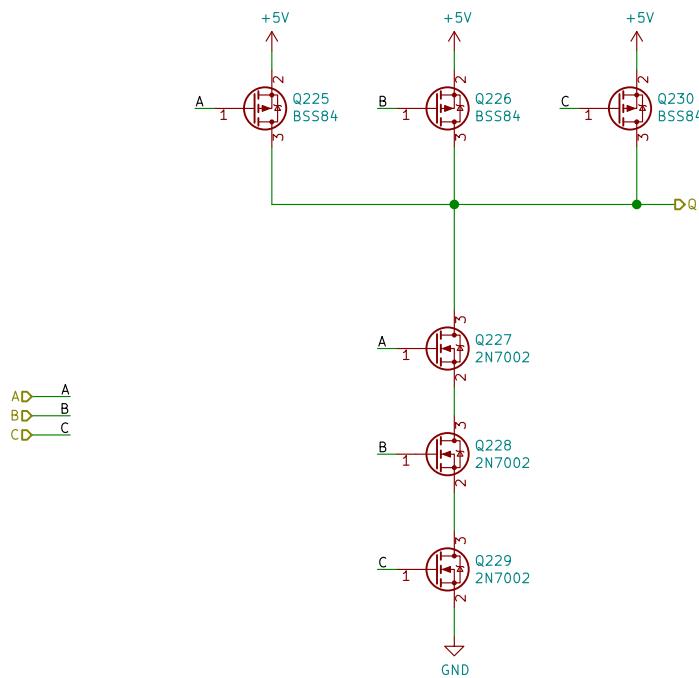
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5E86E86/sheet5EFA5A03/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

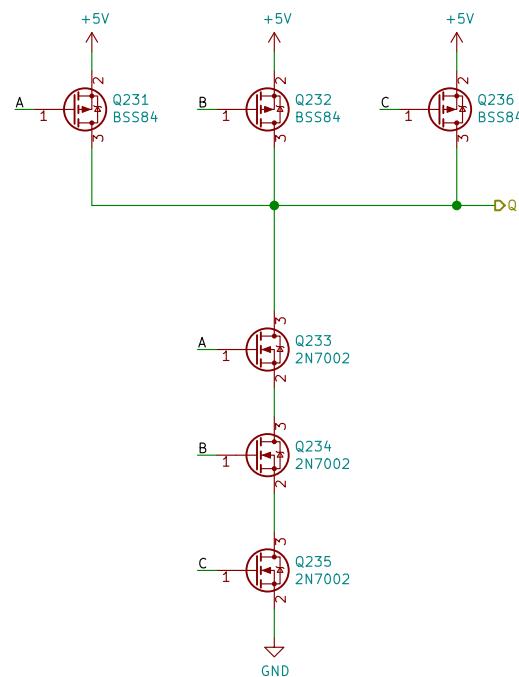
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 58/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5E8FB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

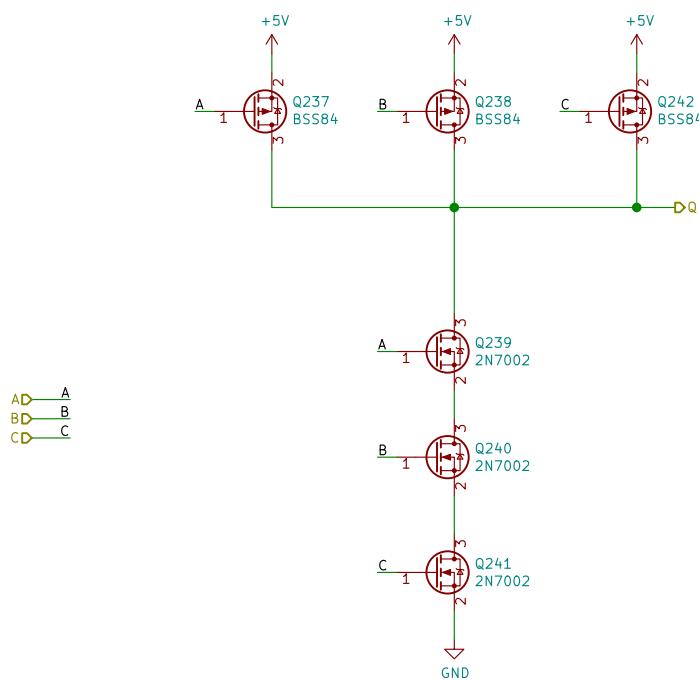
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 59/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

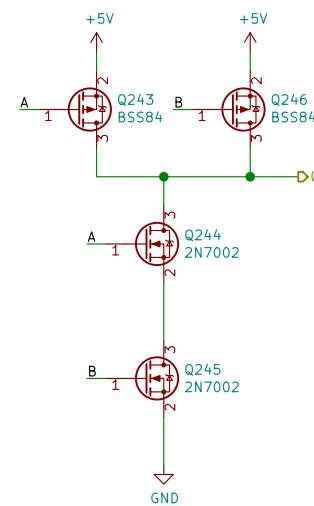
Id: 60/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5E86E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

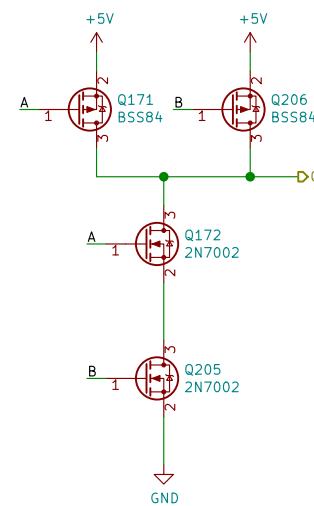
Id: 61/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

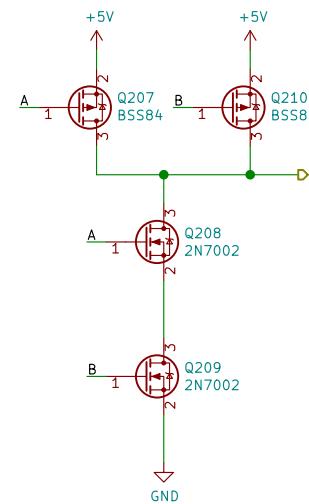
Id: 62/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F18011E/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 63/362

A

A

B

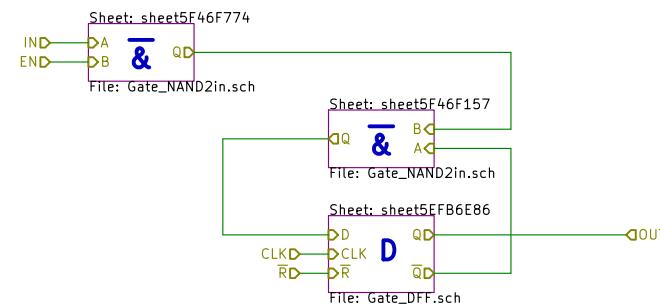
B

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/

File: MemCell.sch

**Title: Fets and Crosses**

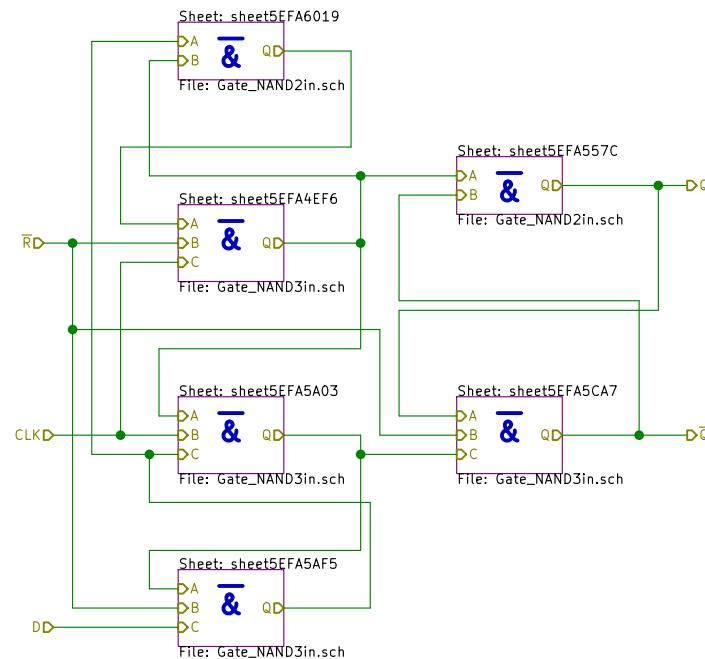
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 64/362

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CLKD

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DQ-bar

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

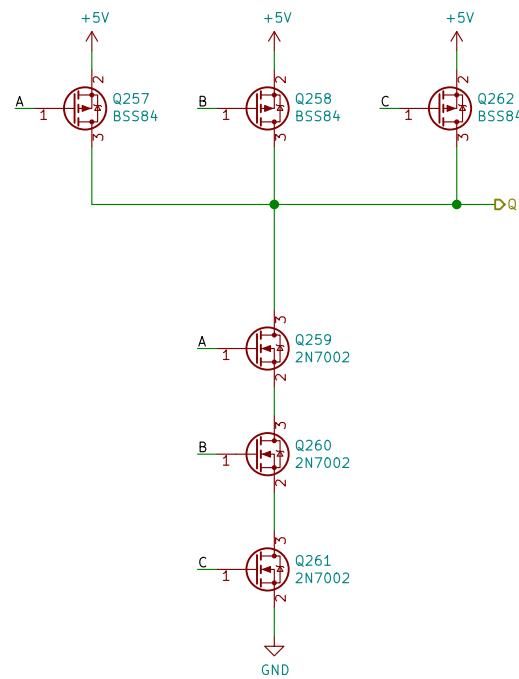
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File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 65/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5EFA4EF6/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

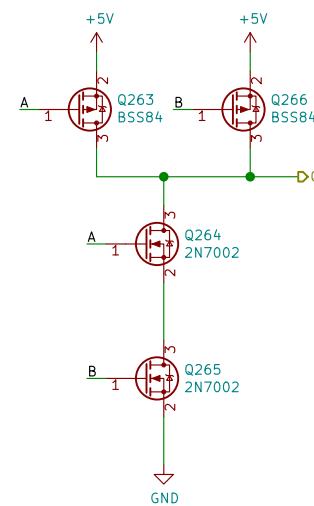
Id: 66/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

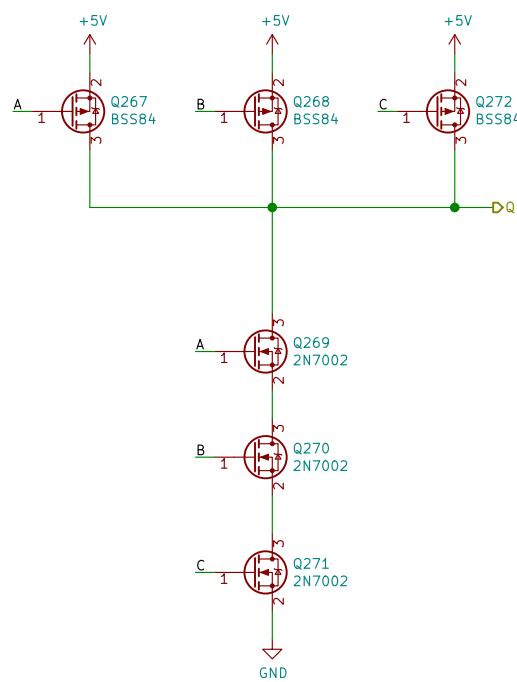
Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5E86E86/sheet5EFA557C/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

Id: 67/362
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

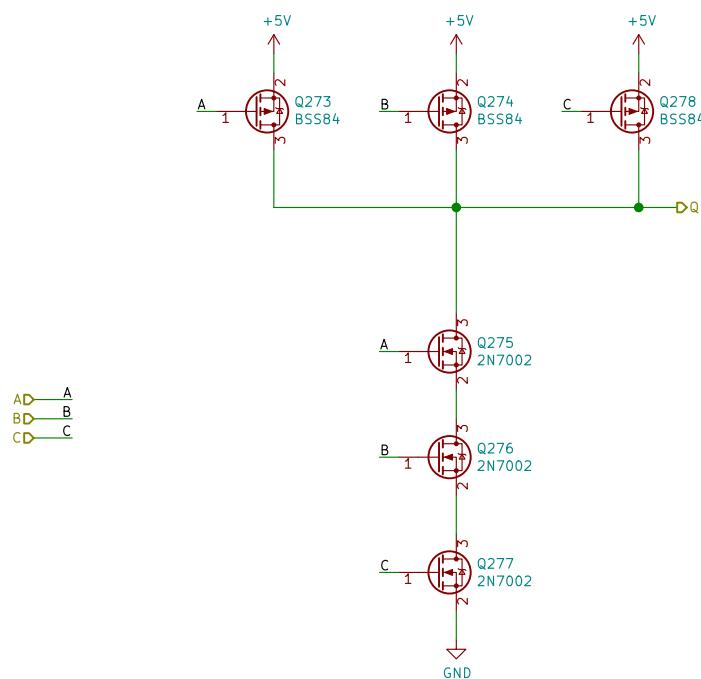
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 68/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

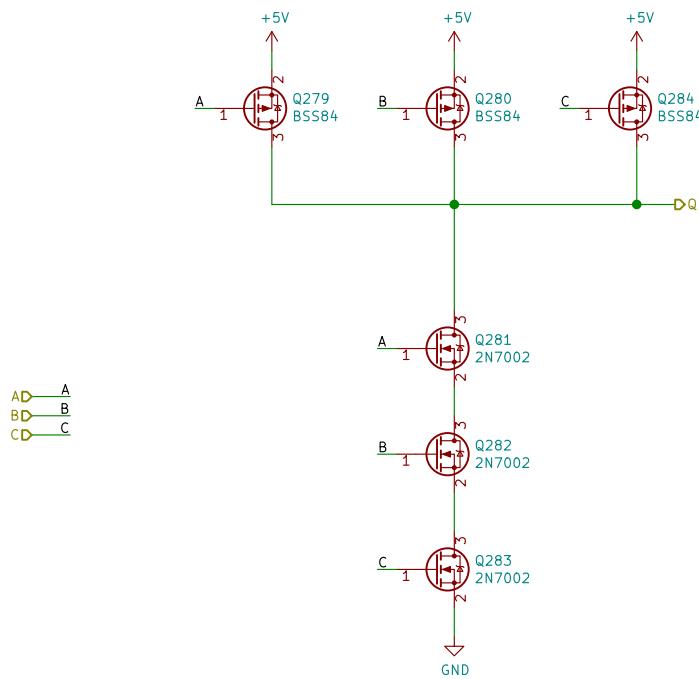
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 69/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5EFA5CA7/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 70/362

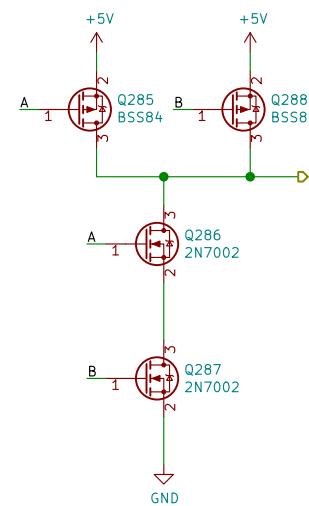
A

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AD—A  
BD—B



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5EFA6019/sheet5EFA6019/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

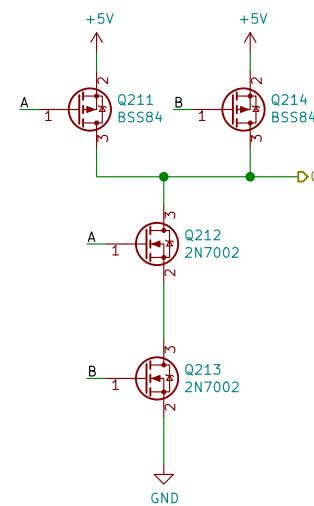
Id: 71/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

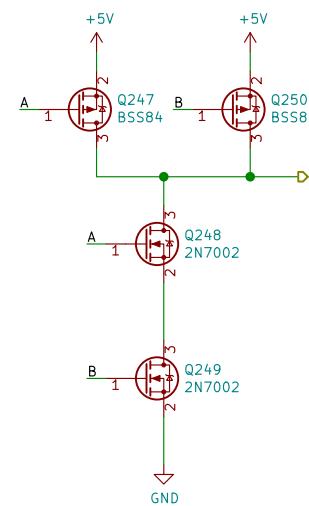
Id: 72/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A6/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

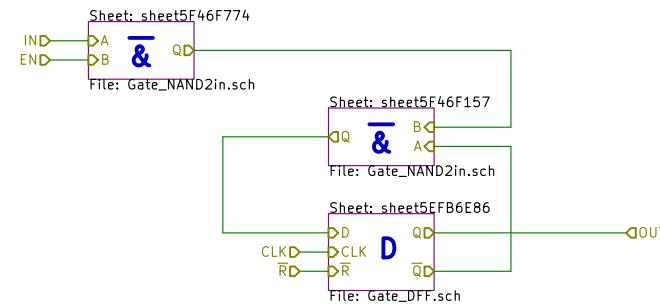
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 73/362

A



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A

B

C

D

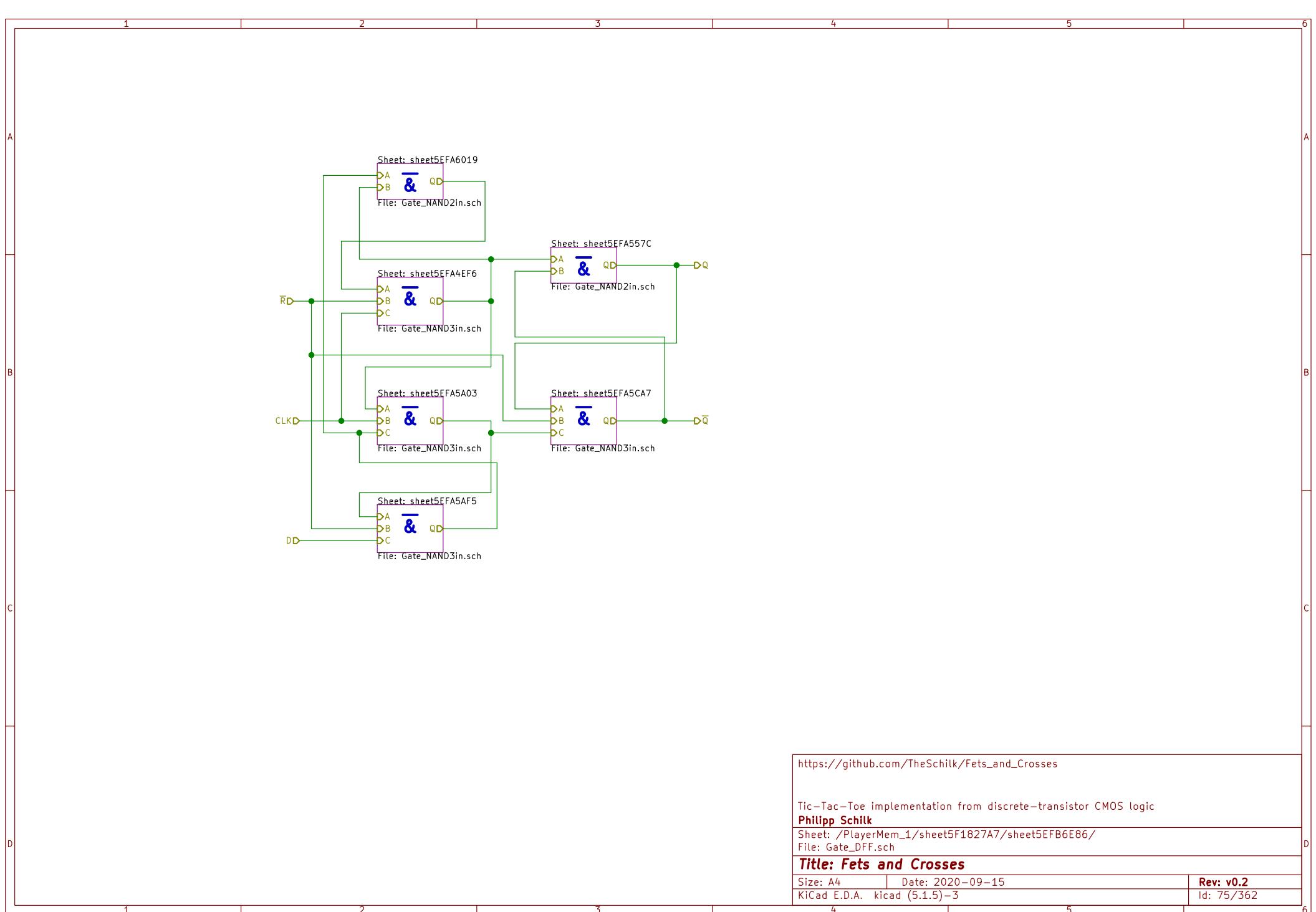
[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_1/sheet5F1827A7/  
 File: MemCell.sch

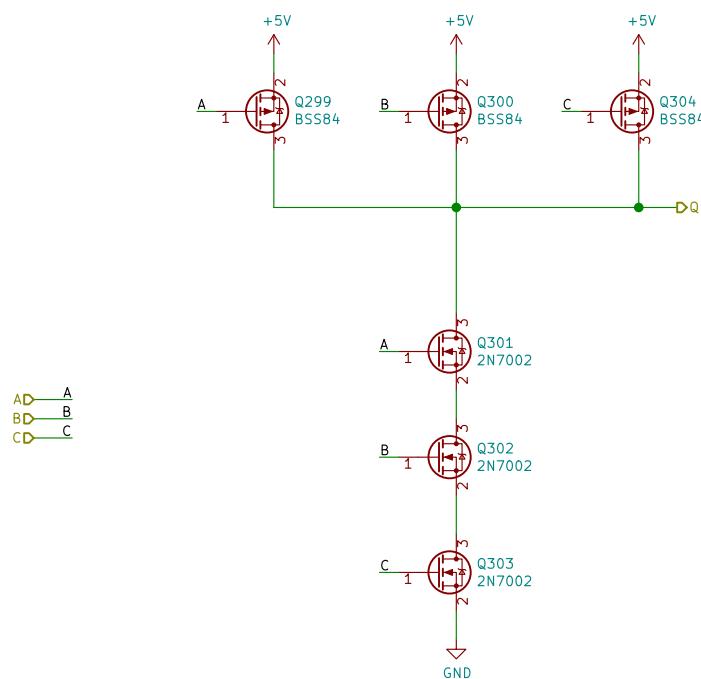
### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 74/362



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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5EFA4EF6/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

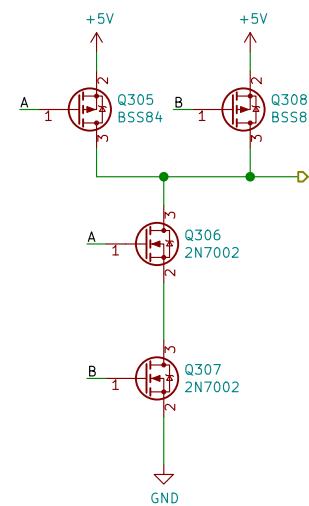
Id: 76/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5EFA557C/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

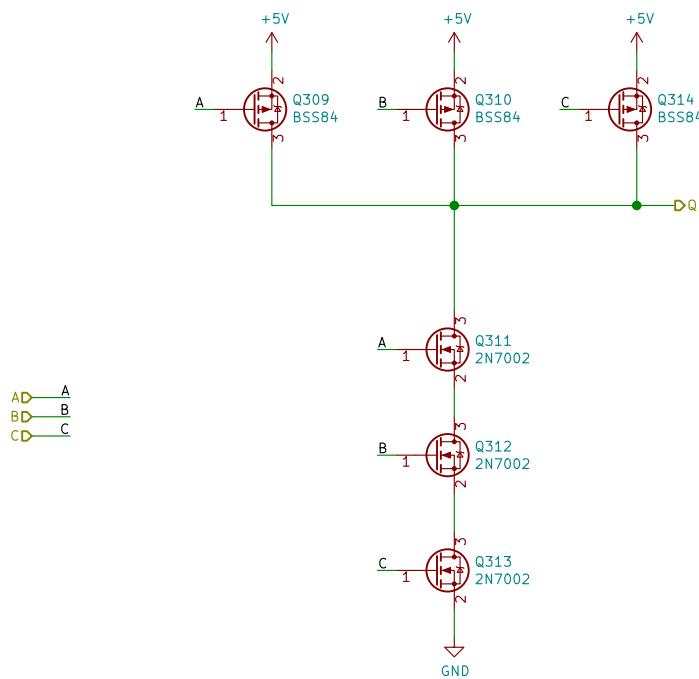
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 77/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5EFA5A03/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

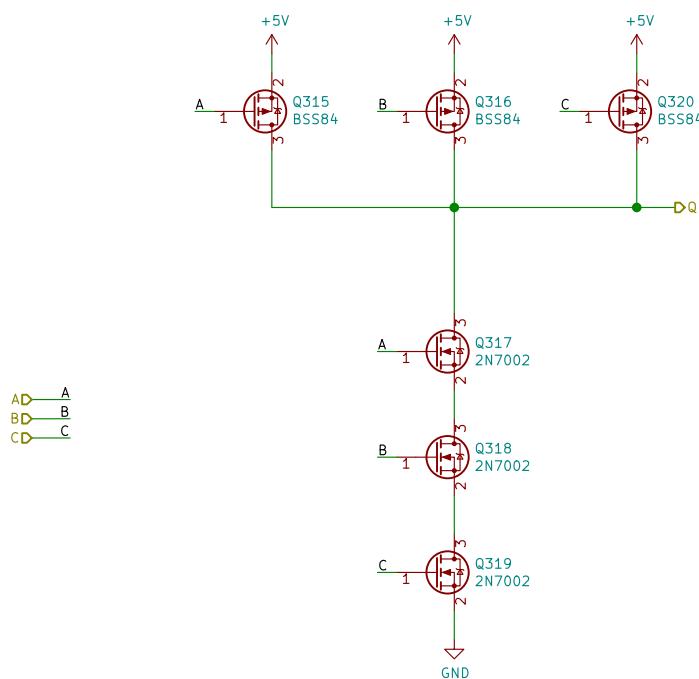
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 78/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

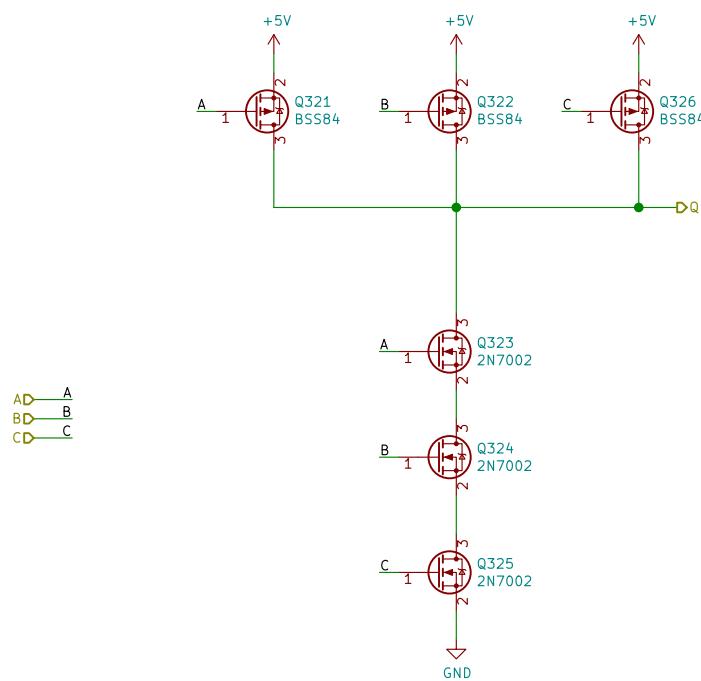
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 79/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5EFA5CA7/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

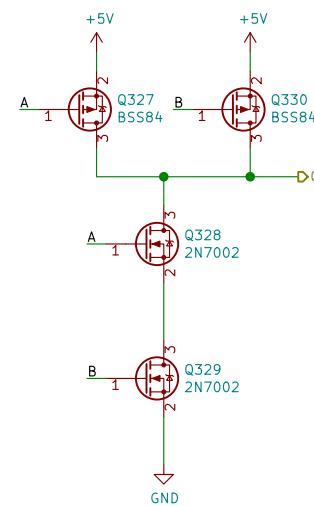
Id: 80/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5EFA6019/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

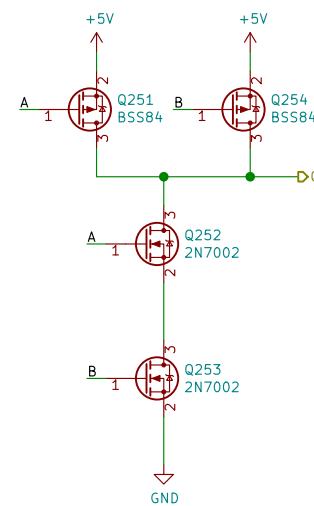
Id: 81/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 82/362

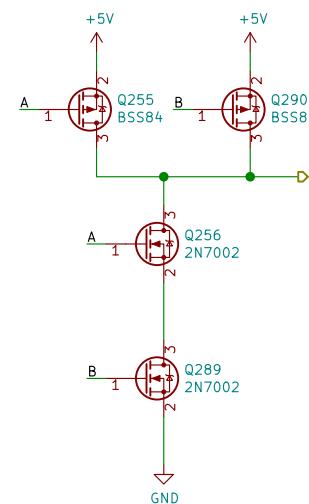
A

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AD—A  
BD—B



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMem\_1/sheet5F1827A7/sheet5F46F774/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 83/362

A

A

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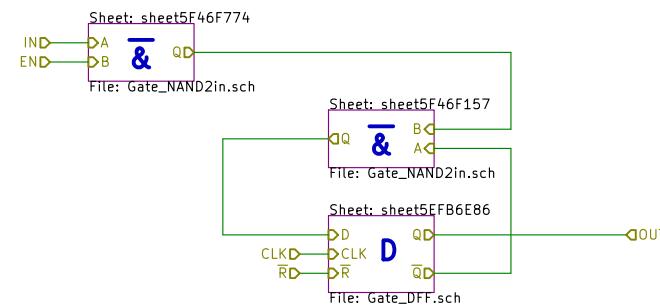
B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/

File: MemCell.sch

**Title: Fets and Crosses**

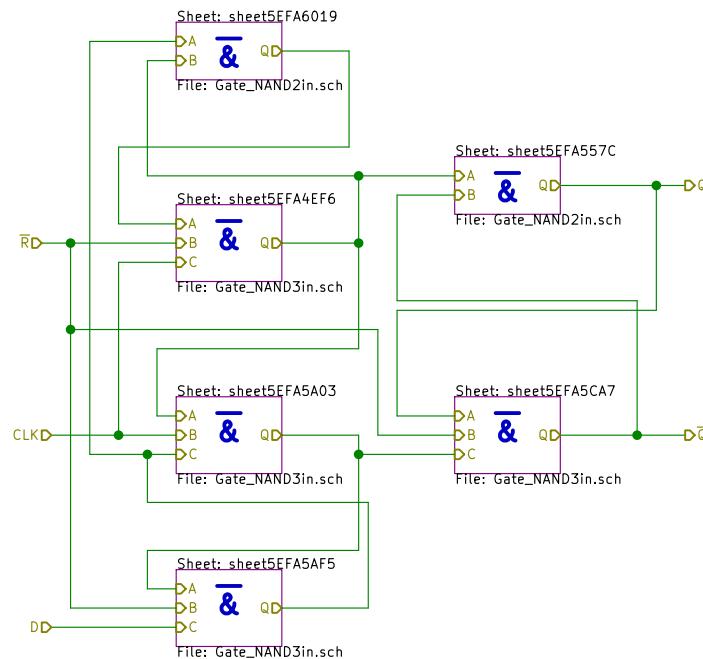
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 84/362

A



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A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

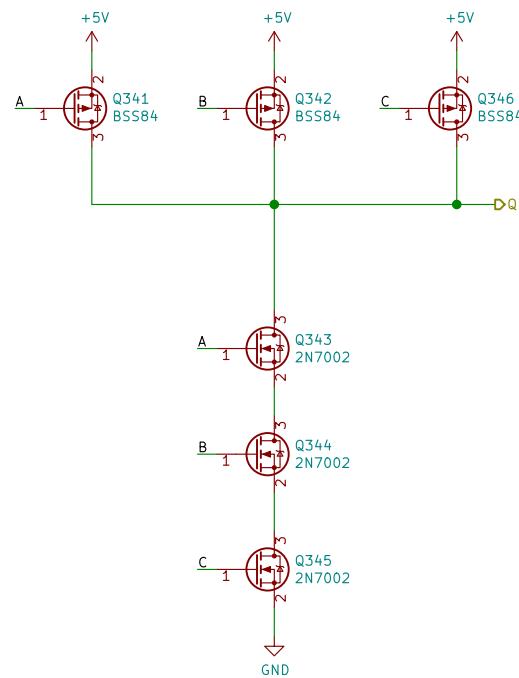
Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFB6E86/  
 File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 85/362

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

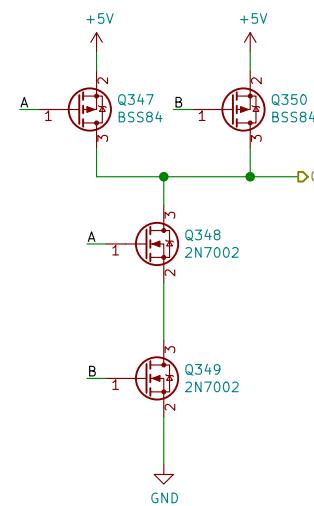
Id: 86/362

A

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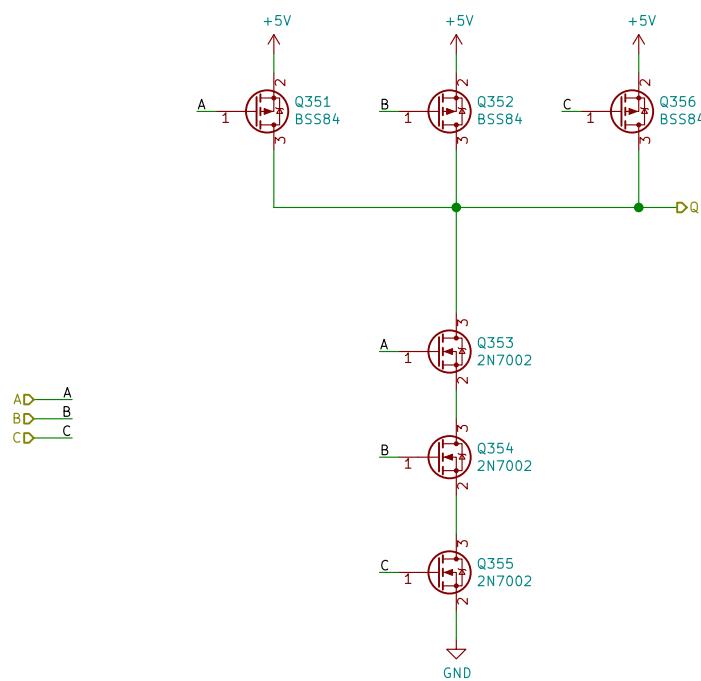
AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5E86E86/sheet5EFA557C/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15	Rev: v0.2
KiCad E.D.A. kicad (5.1.5)-3		Id: 87/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

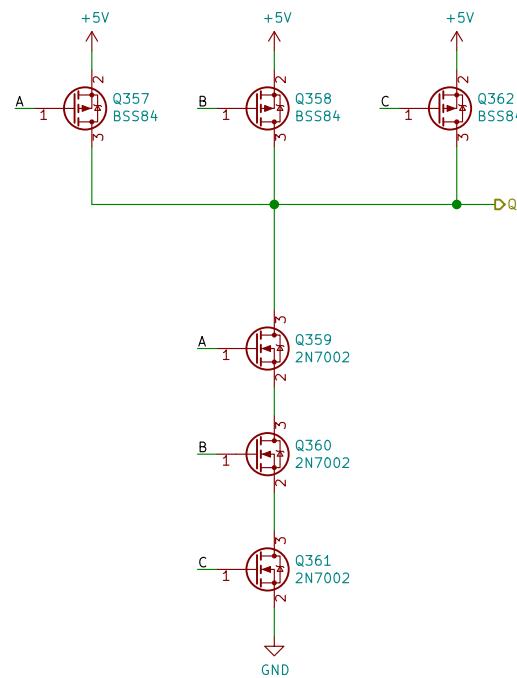
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 88/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

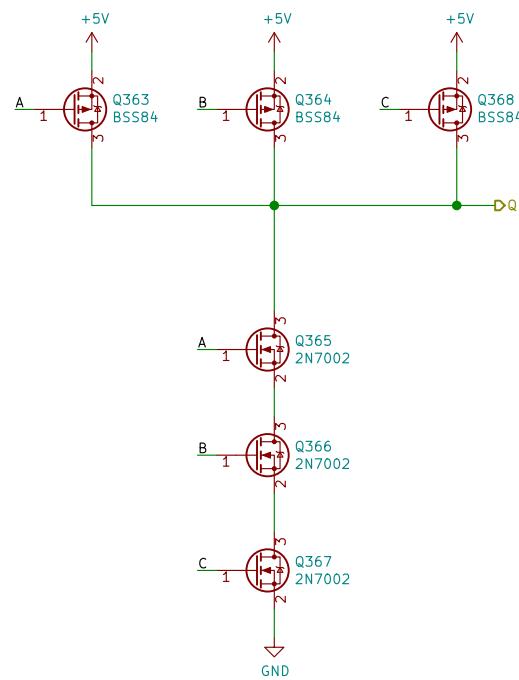
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 89/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFA5CA7/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

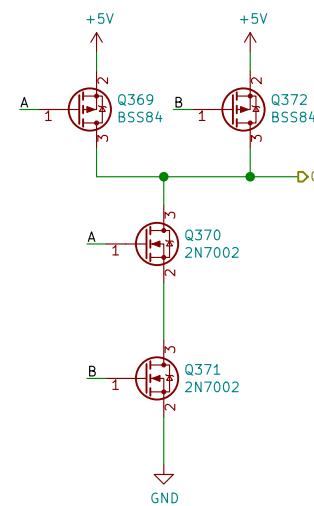
Id: 90/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5EFA6019/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 91/362

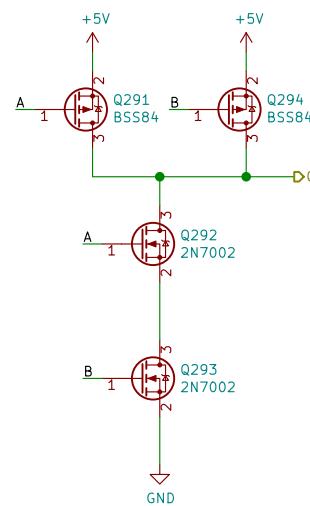
A

B

C

D

The diagram consists of two parallel horizontal green lines. The top line is labeled 'A' at its right end, and the bottom line is labeled 'B' at its right end. Both labels are in black font, positioned above their respective lines.



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827  
File: Gate NAND2in.sch

## Title: *Fets and Crosses*

Size: A4 Date: 2

Rev: v0.2

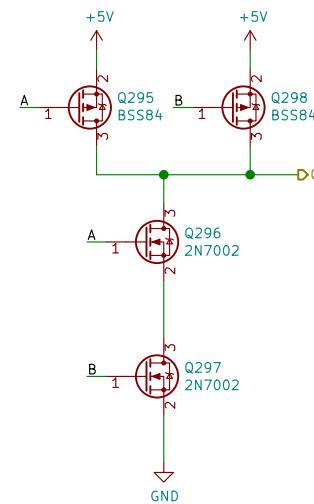
REV: V0.2

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_1/sheet5F1827A8/sheet5F46F774/

File: Gate\_NAND2in.sch

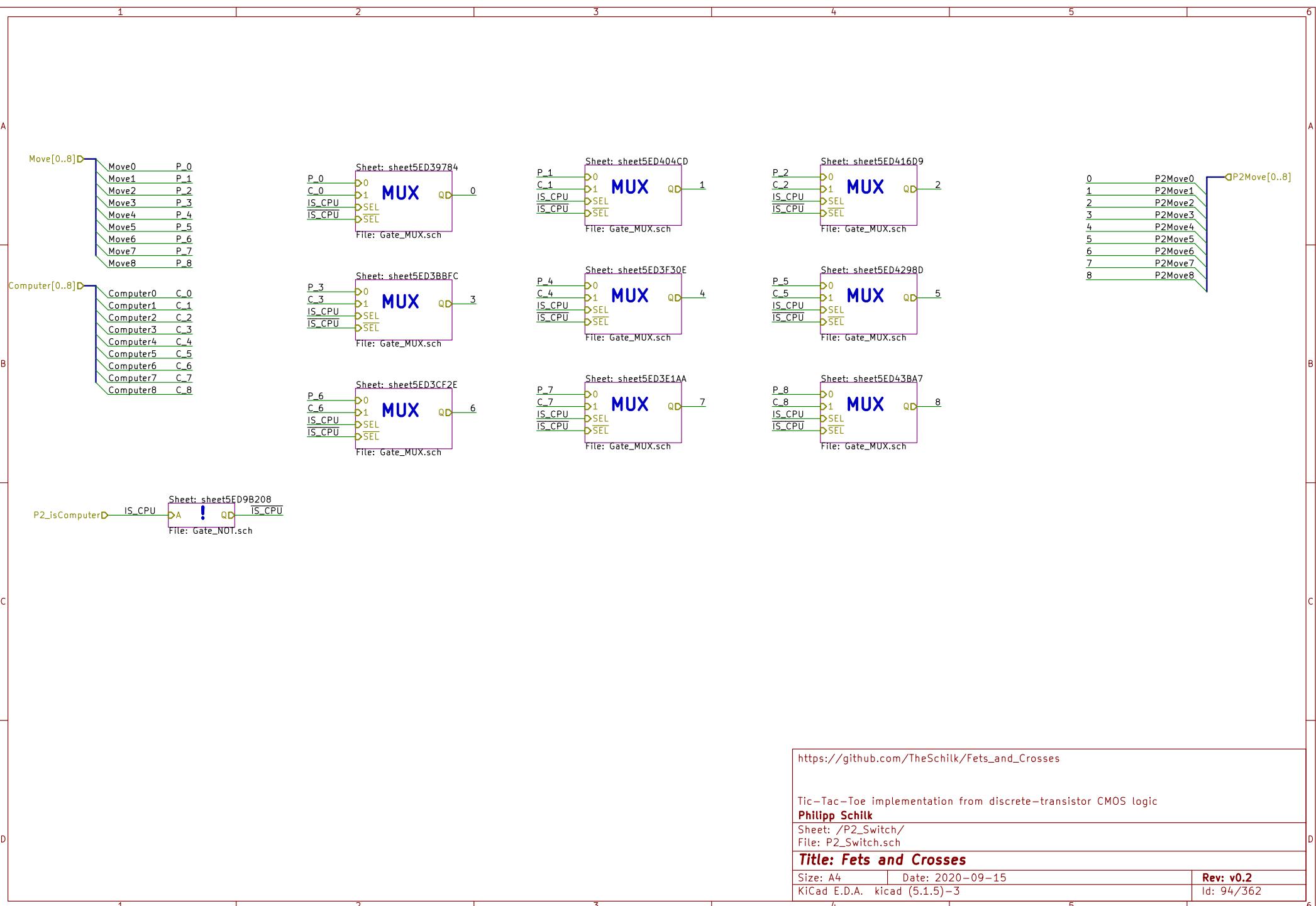
**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 93/362



A

A

B

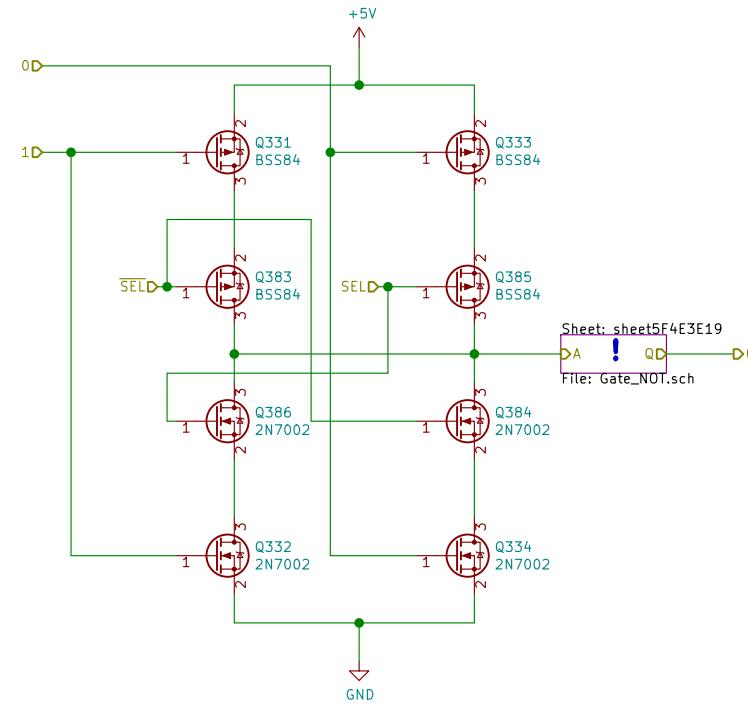
B

C

C

D

D



Sheet: sheet5F4E3E19

File: Gate\_NOT.sch

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED39784/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 95/362

A

B

C

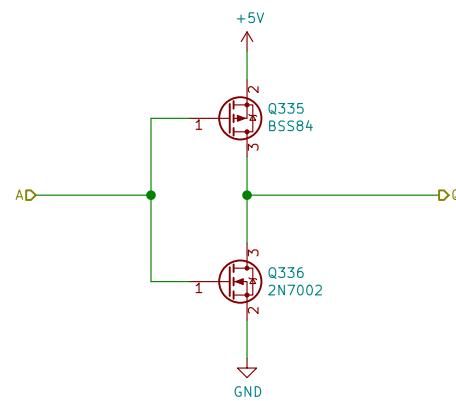
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED39784/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 96/362

A

A

B

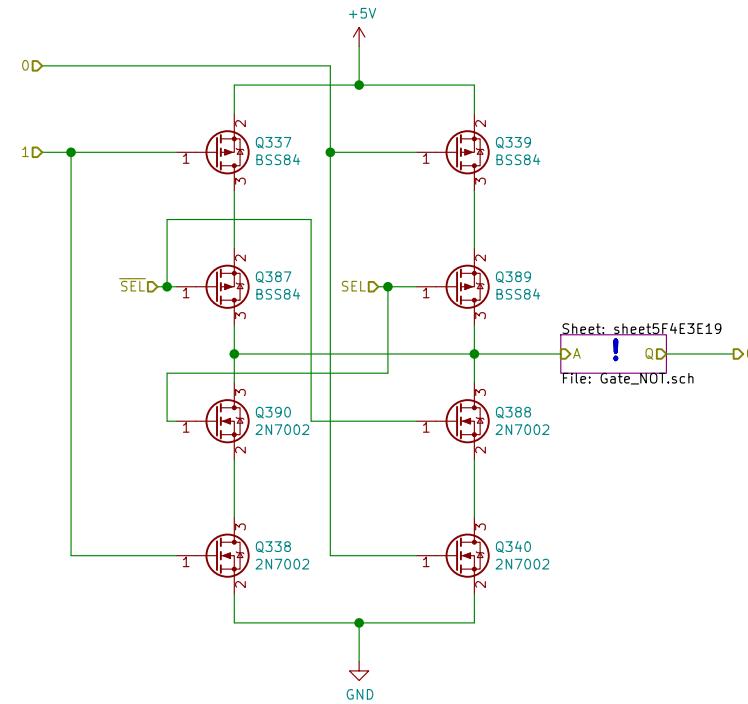
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED3BBFC/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 97/362

A

B

C

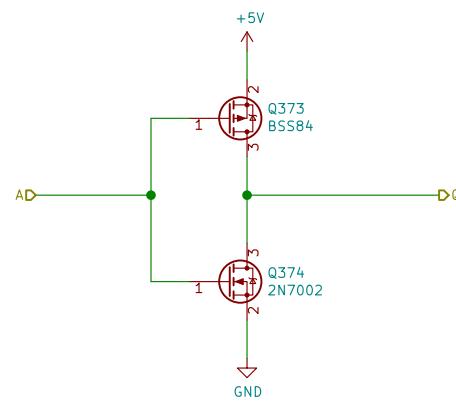
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED3BBFC/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 98/362

A

A

B

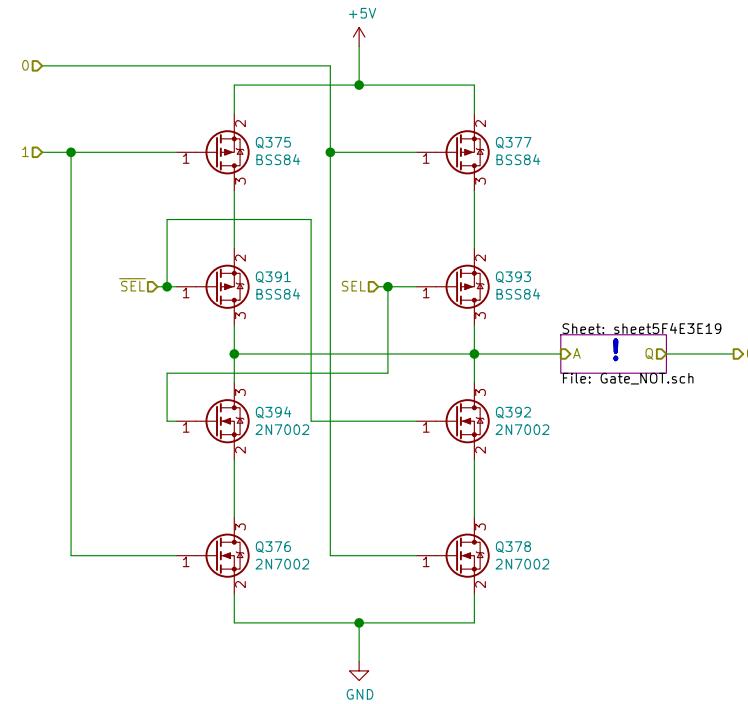
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED3CF2E/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 99/362

A

B

C

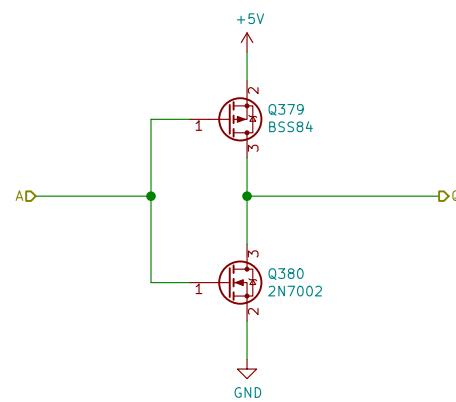
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED3CF2E/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 100/362

A

A

B

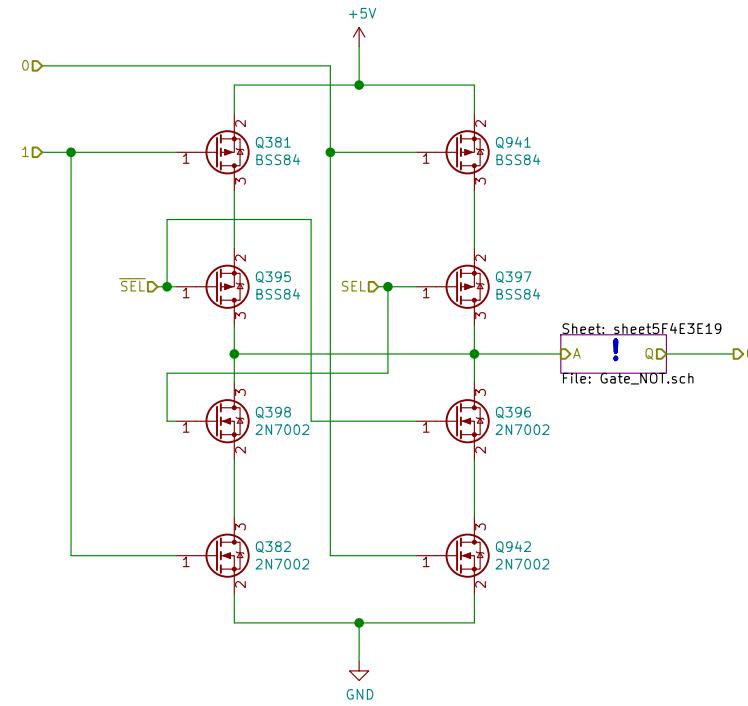
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED3E1AA/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 101/362

A

B

C

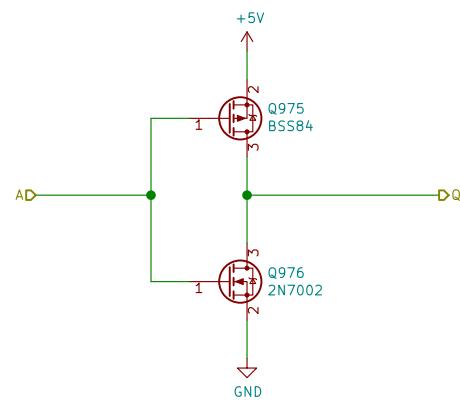
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED3E1AA/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 102/362

A

A

B

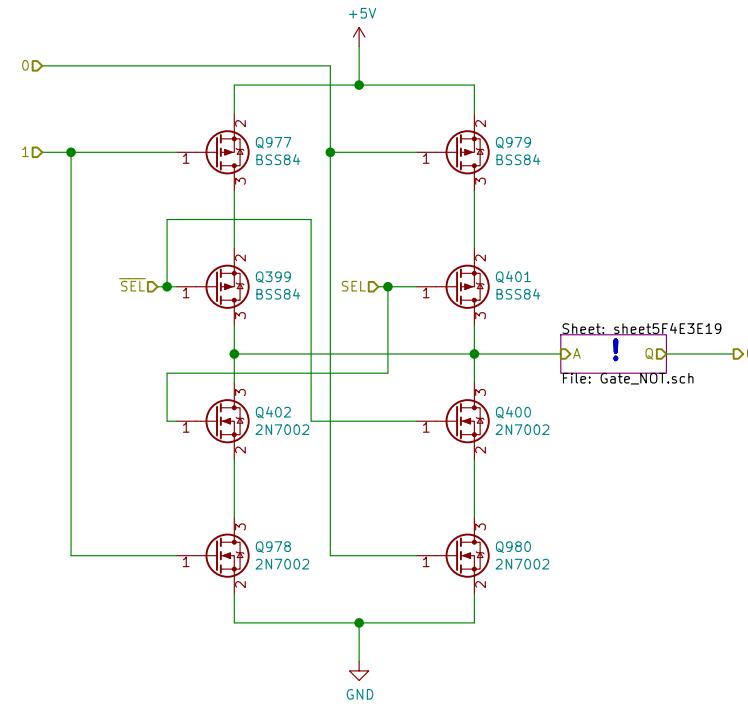
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED3F30E/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 103/362

A

B

C

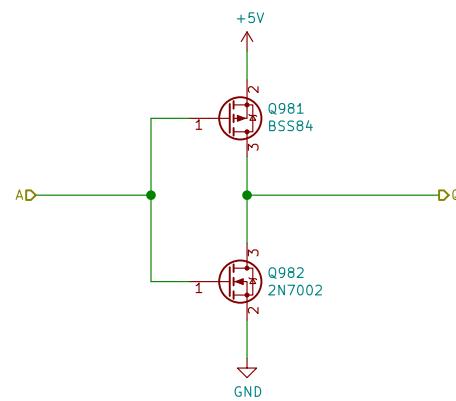
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED3F30E/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 104/362

A

A

B

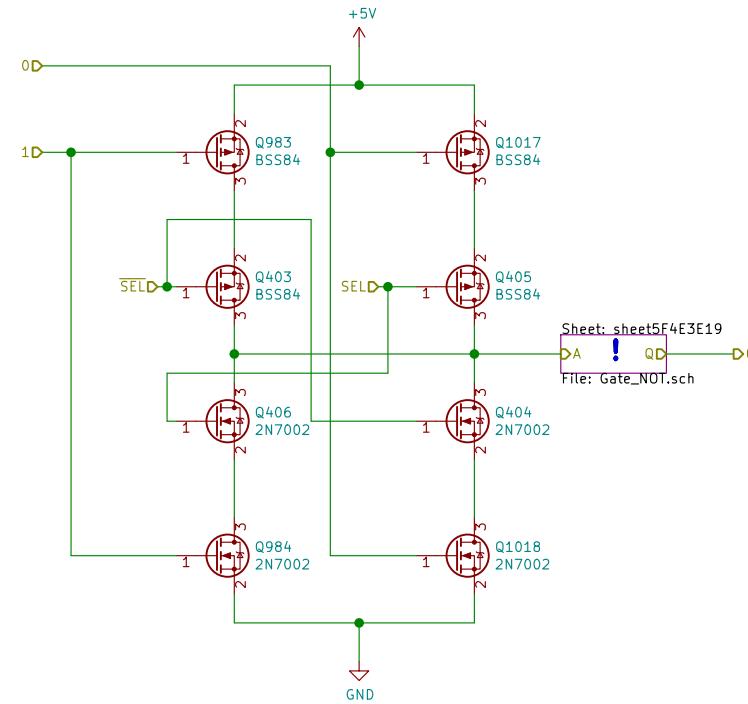
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED404CD/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 105/362

A

B

C

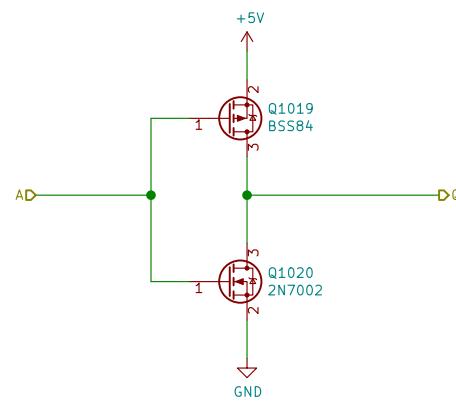
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED404CD/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 106/362

A

A

B

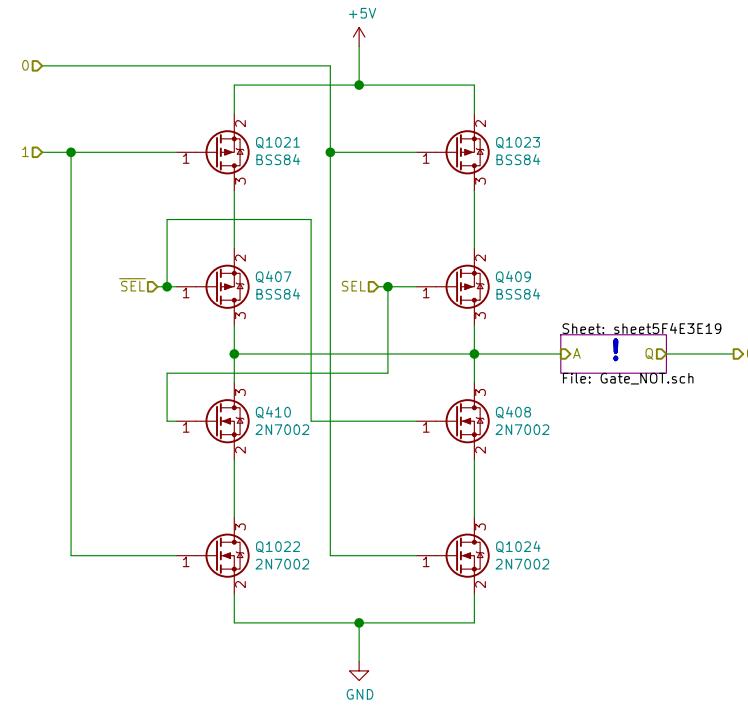
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED416D9/  
File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 107/362

A

B

C

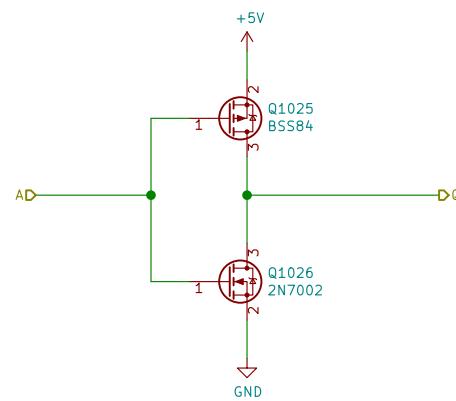
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED416D9/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 108/362

A

A

B

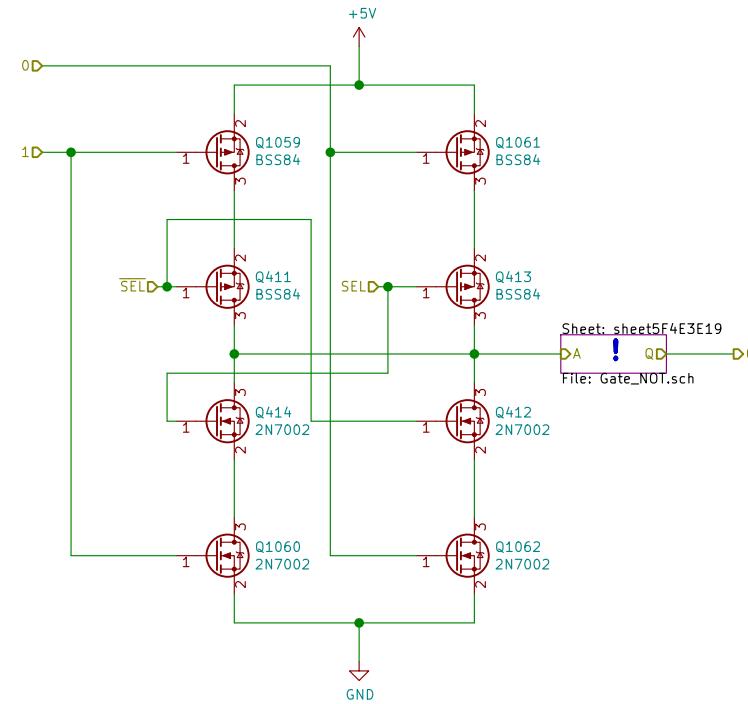
B

C

C

D

D



Sheet: sheet5F4E3E19

File: Gate\_NOT.sch

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED4298D/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 109/362

A

B

C

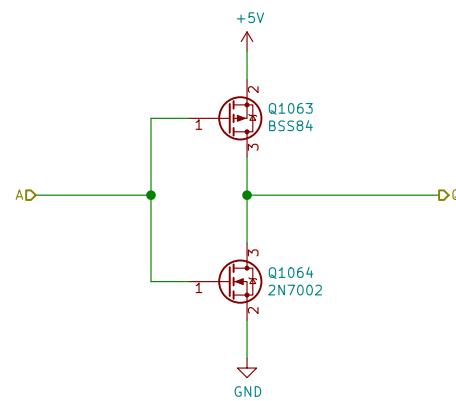
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED4298D/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 110/362

A

A

B

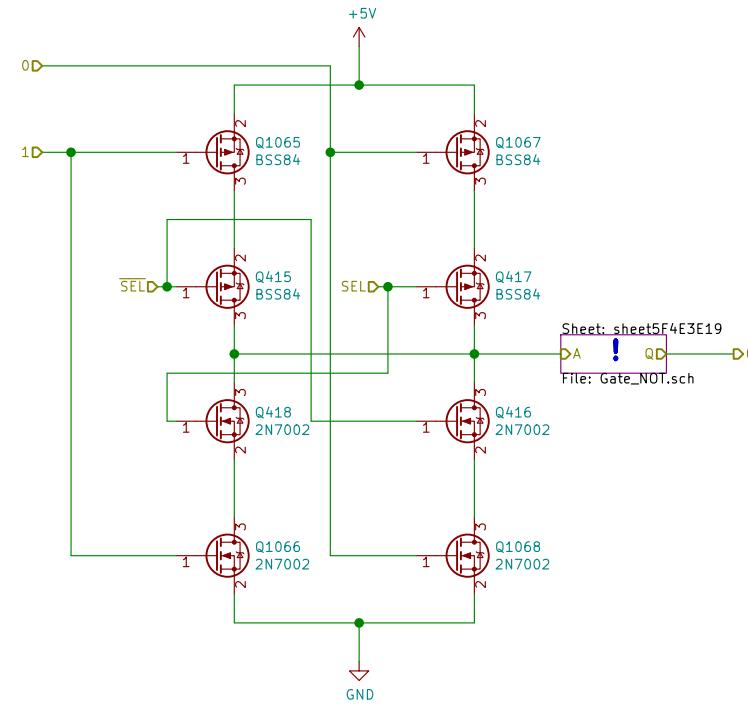
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /P2\_Switch/sheet5ED43BA7/

File: Gate\_MUX.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 111/362

A

B

C

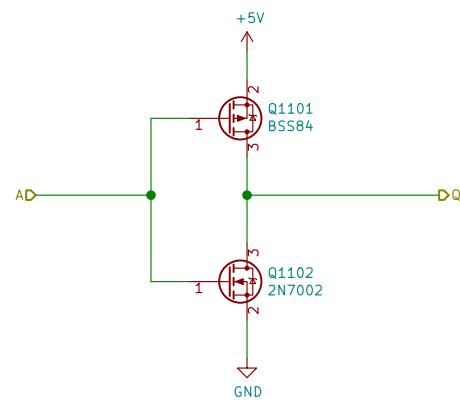
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED43BA7/sheet5F4E3E19/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 112/362

A

B

C

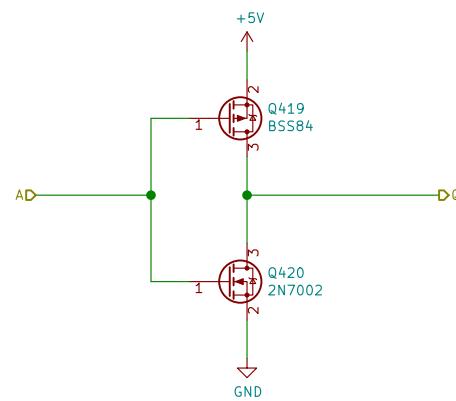
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /P2\_Switch/sheet5ED9B208/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

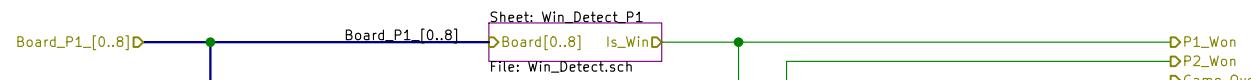
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 113/362

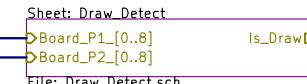
### Check if P1 Won



### Check if P2 Won



### Check if Draw



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

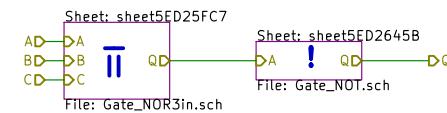
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: /EndState\_Detect/  
File: EndState\_Detect.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 114/362



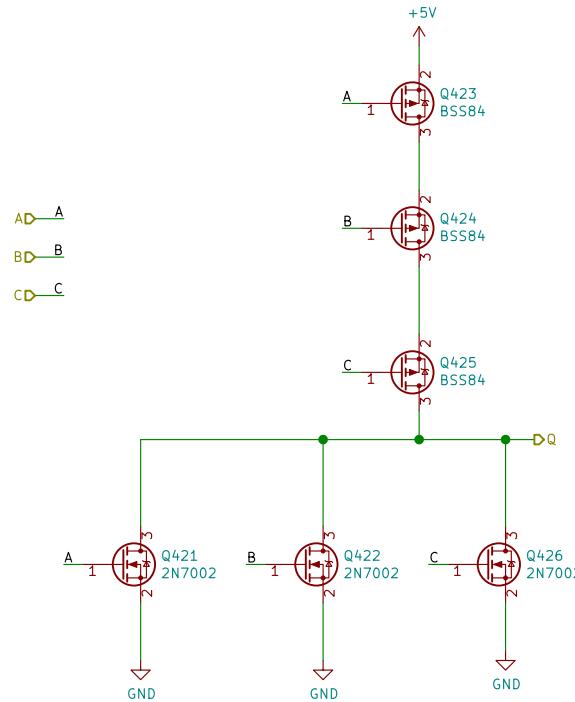
[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /EndState\_Detect/sheet5ED298A3/  
 File: Gate\_OR3in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 115/362



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/sheet5ED298A3/sheet5ED25FC7/

File: Gate\_NOR3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 116/362

A

B

C

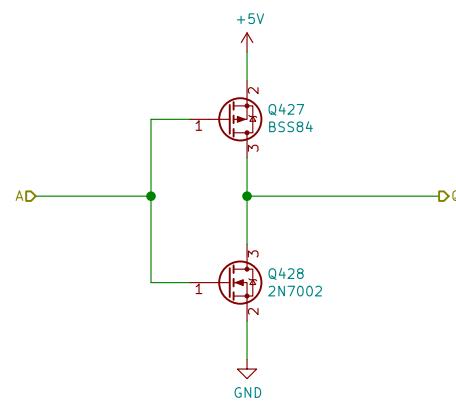
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /EndState\_Detect/sheet5ED298A3/sheet5ED2645B/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

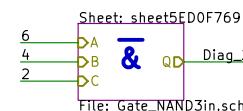
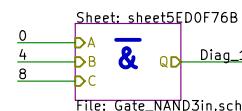
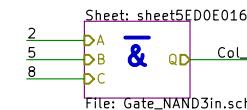
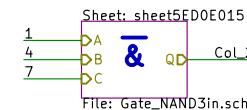
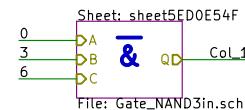
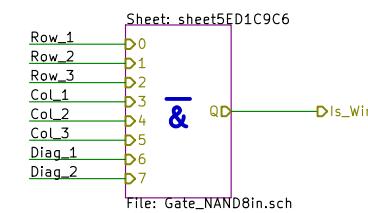
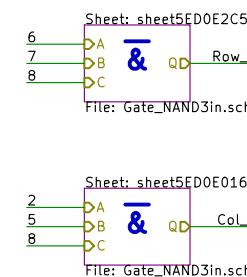
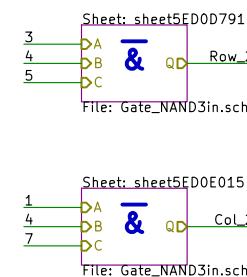
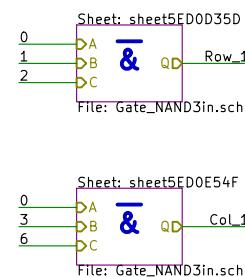
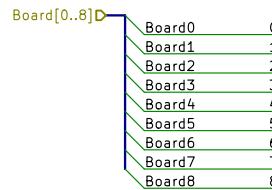
KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 117/362

1 2 3 4 5 6

Checks if a Player has won by AND-ing all Rows, Cols, and Diags individually



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /EndState\_Detect/Win\_Detect\_P1/  
 File: Win\_Detect.sch

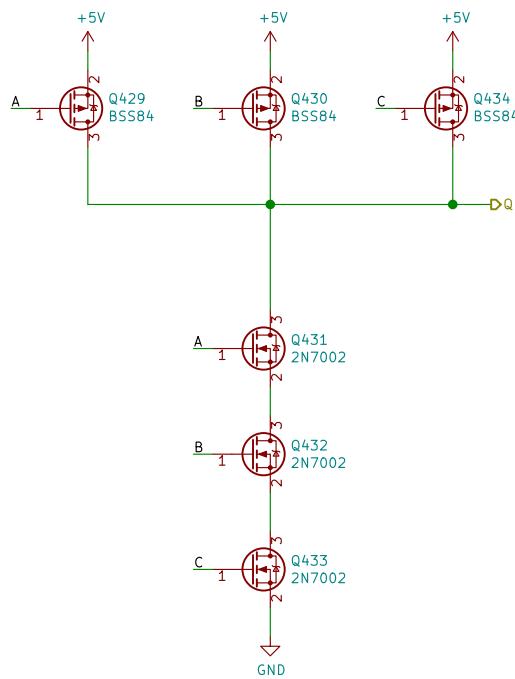
### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 118/362

1 2 3 4 5 6

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0D35D/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 119/362

A

A

B

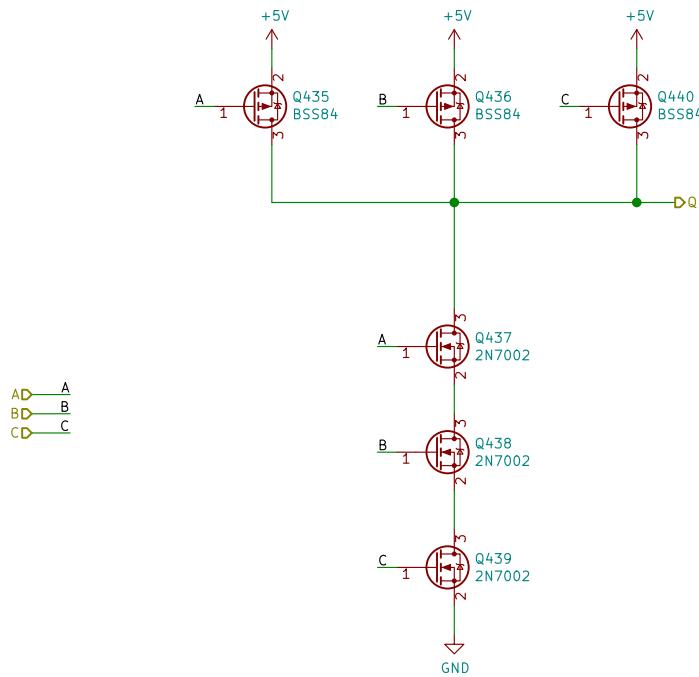
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0D791/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 120/362

A

B

C

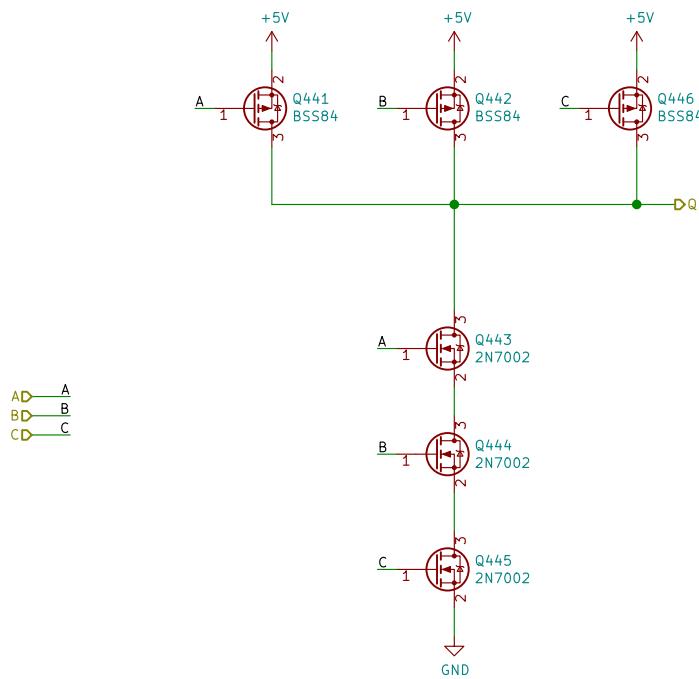
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0E015/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

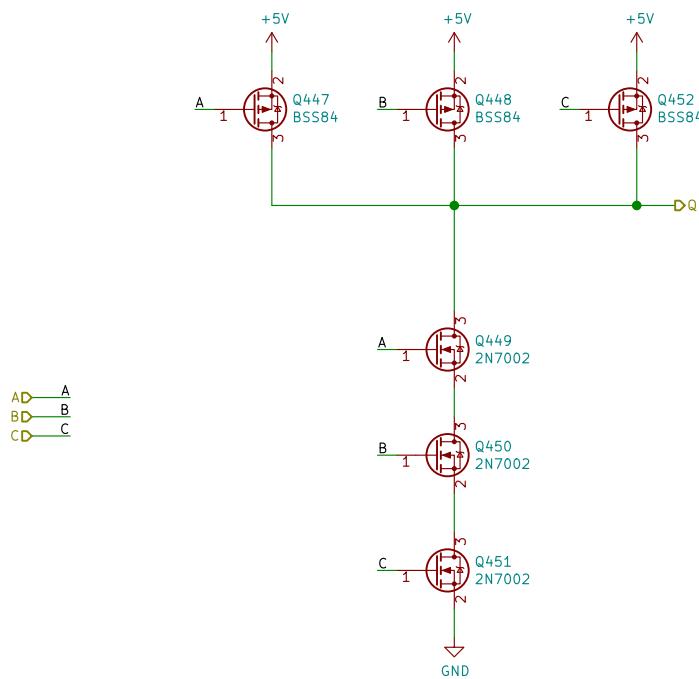
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 121/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0E016/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

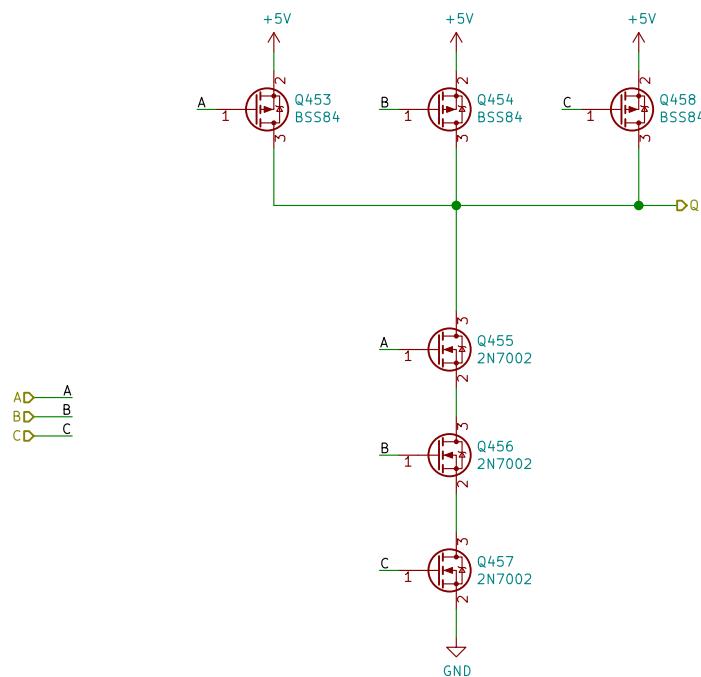
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 122/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0E2C5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

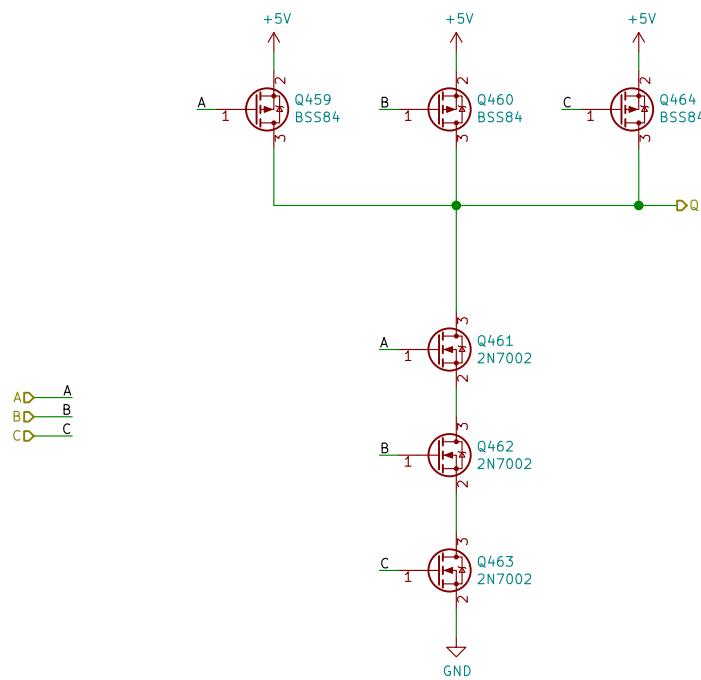
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 123/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0E54F/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

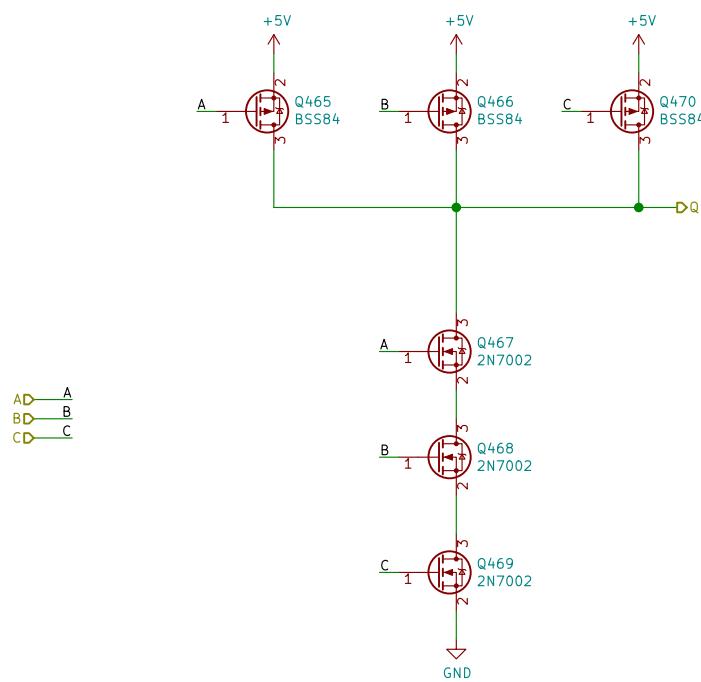
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 124/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0F769/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

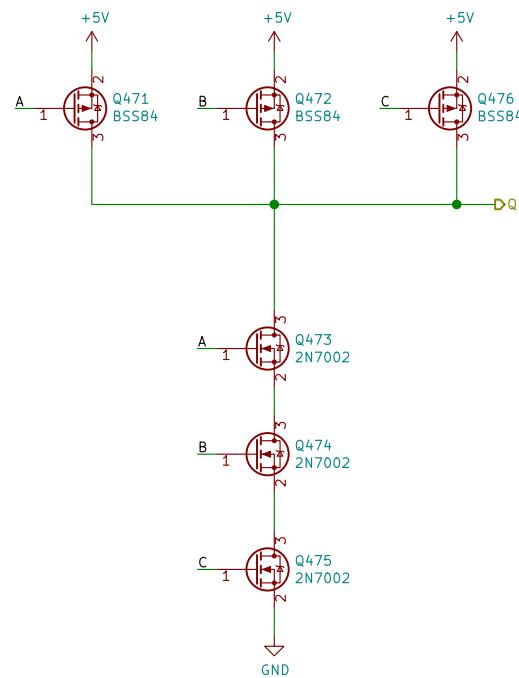
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 125/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P1/sheet5ED0F76B/

File: Gate\_NAND3in.sch

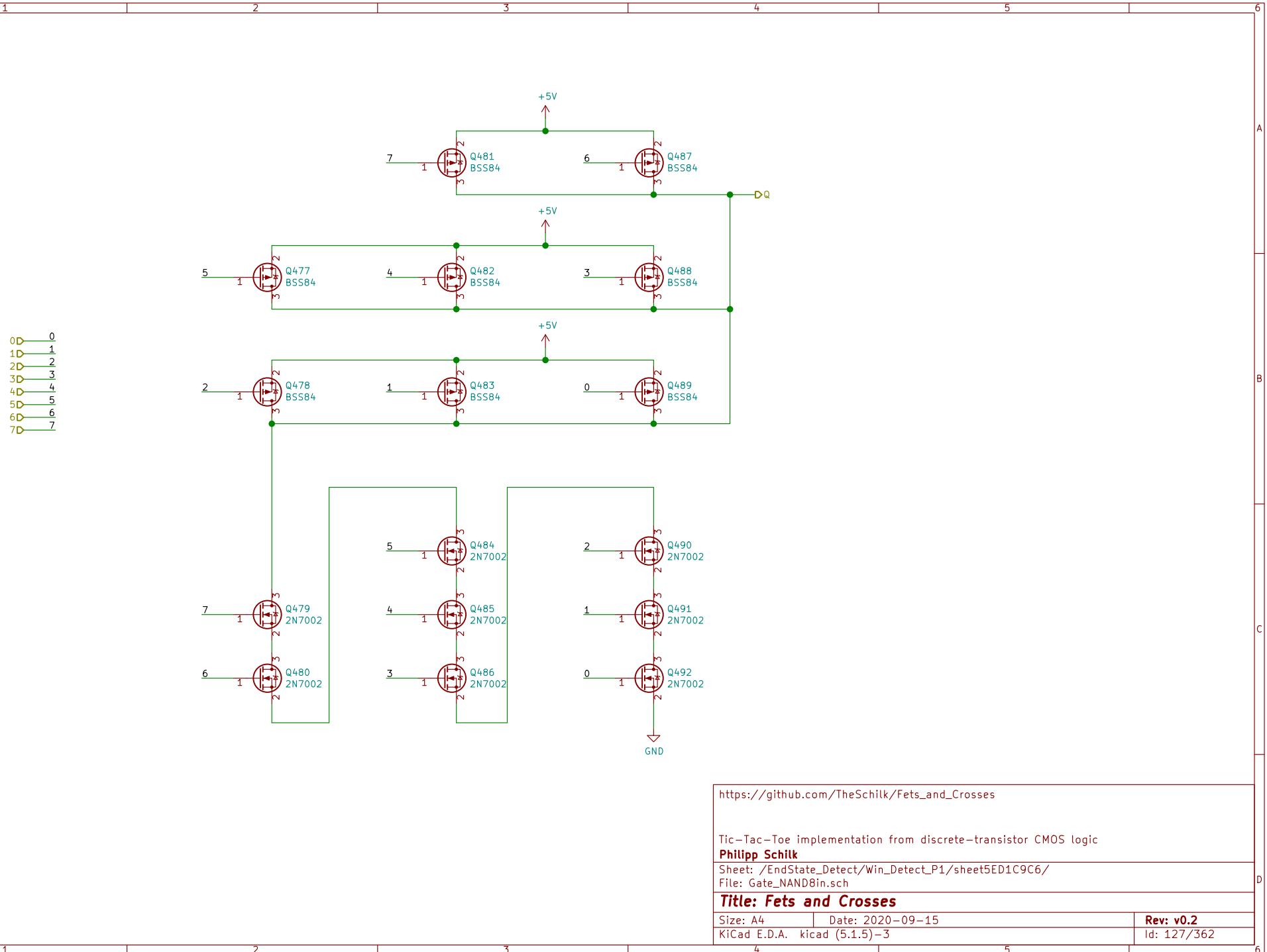
**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

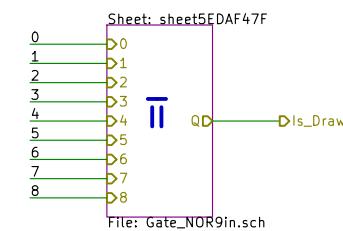
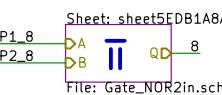
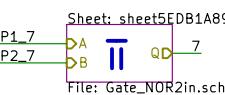
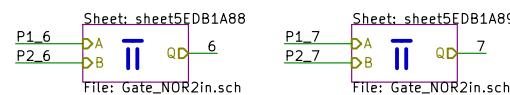
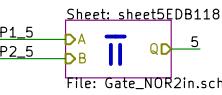
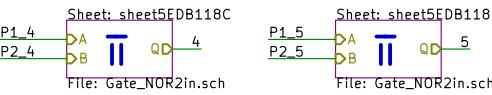
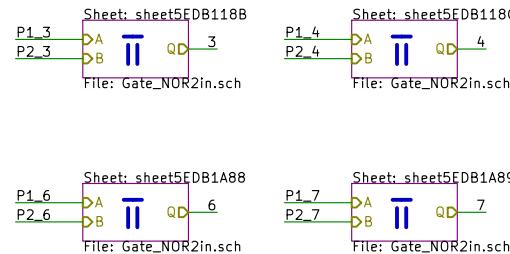
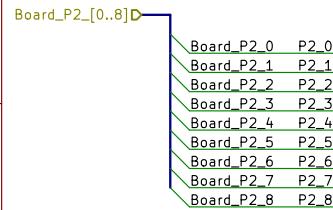
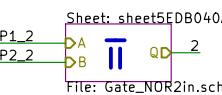
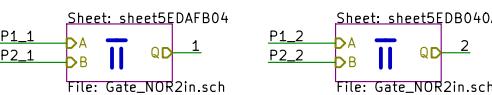
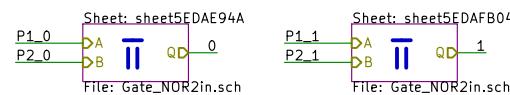
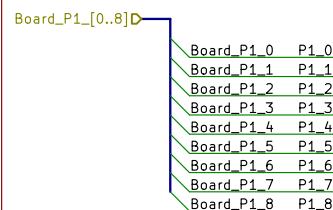
KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 126/362



1 2 3 4 5 6



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /EndState\_Detect/Draw\_Detect/  
File: Draw\_Detect.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 128/362

1 2 3 4 5 6

A

A

B

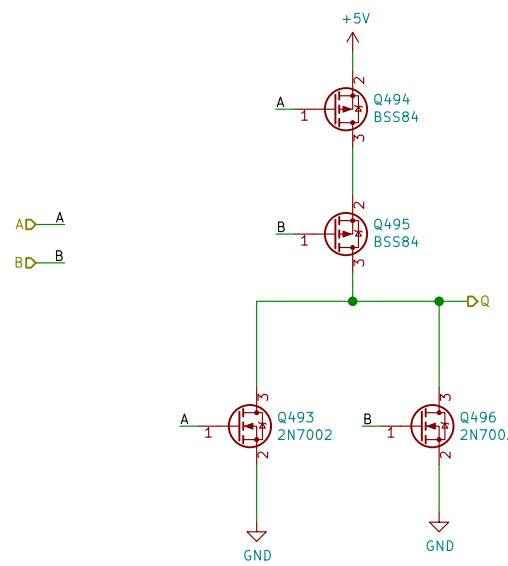
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDAE94A/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

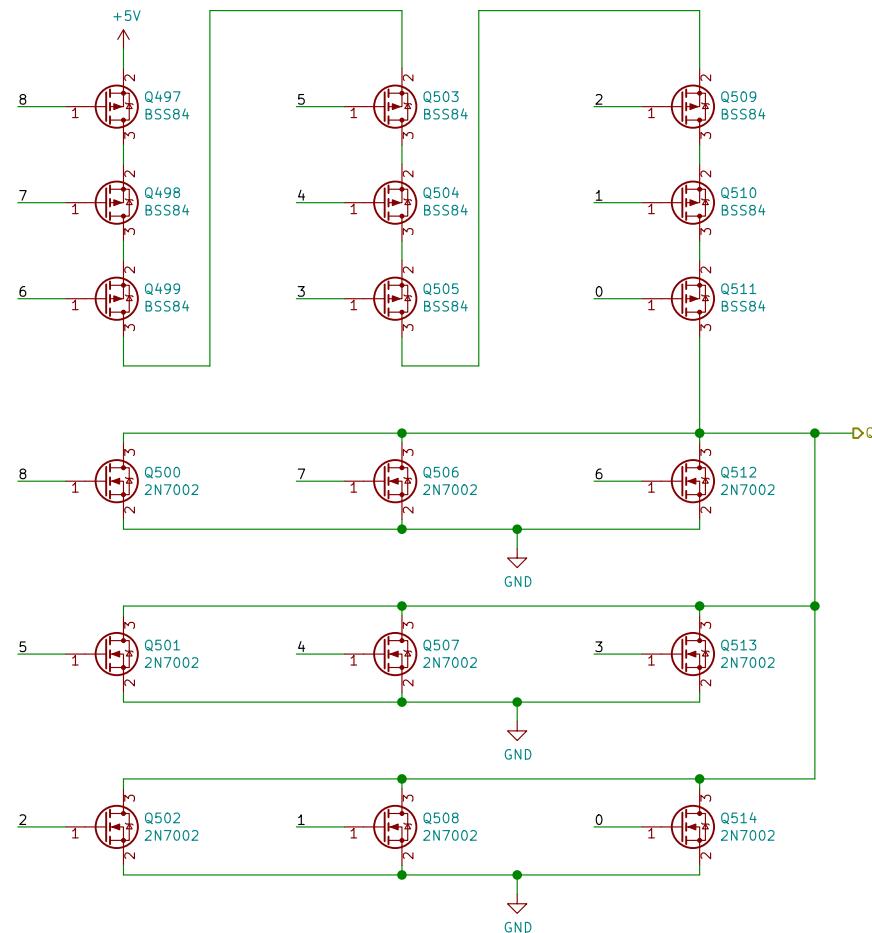
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 129/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDAF47F/

File: Gate\_NOR9in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 130/362

B

C

D

A

B

C

D

A

A

B

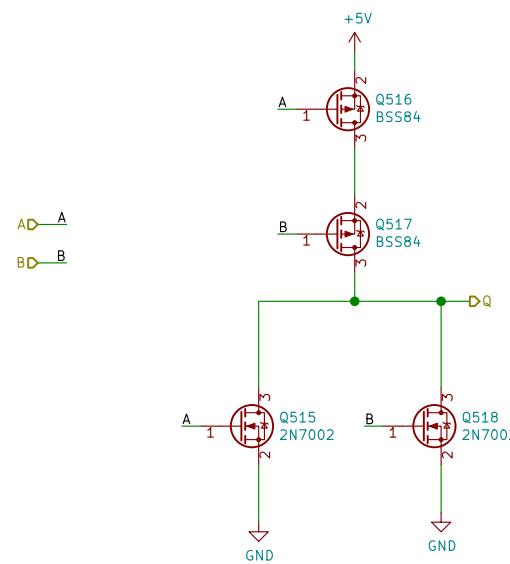
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDAFB04/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 131/362

A

A

B

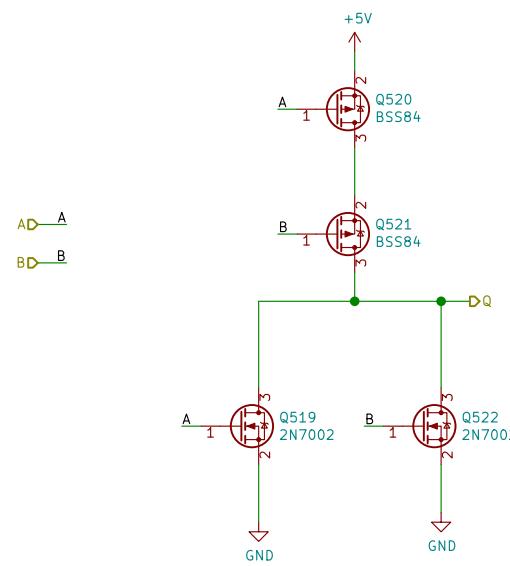
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB118B/  
File: Gate\_NOR2in.sch**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 132/362

A

A

B

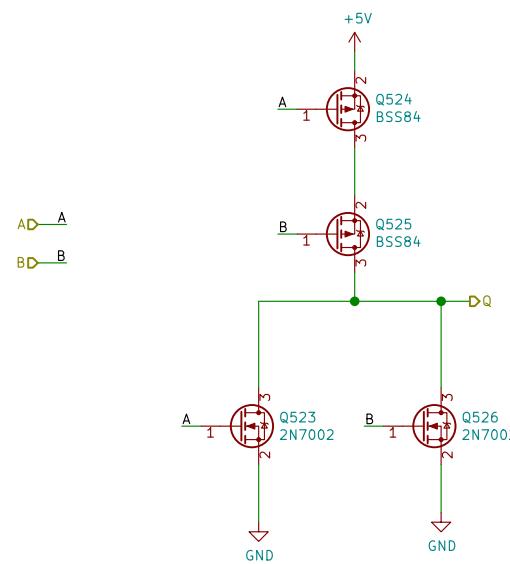
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB118C/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 133/362

A

A

B

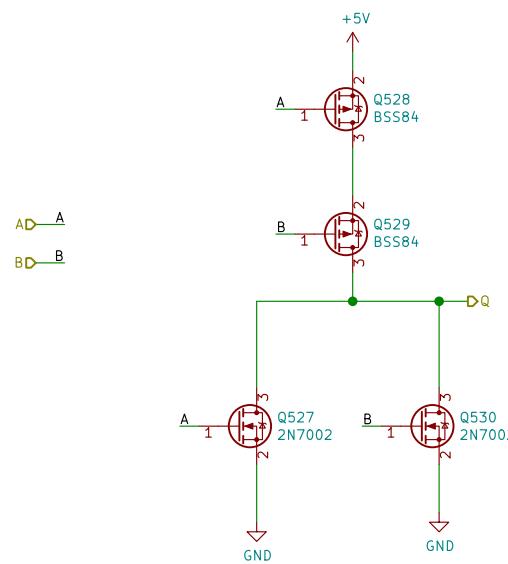
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB118D/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 134/362

A

A

B

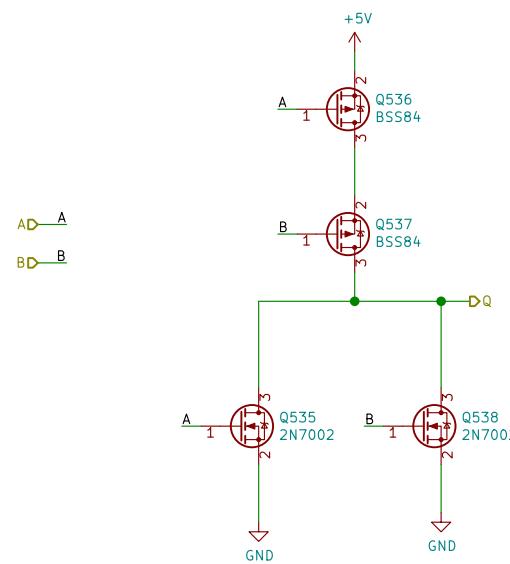
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB1A89/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 135/362

A

A

B

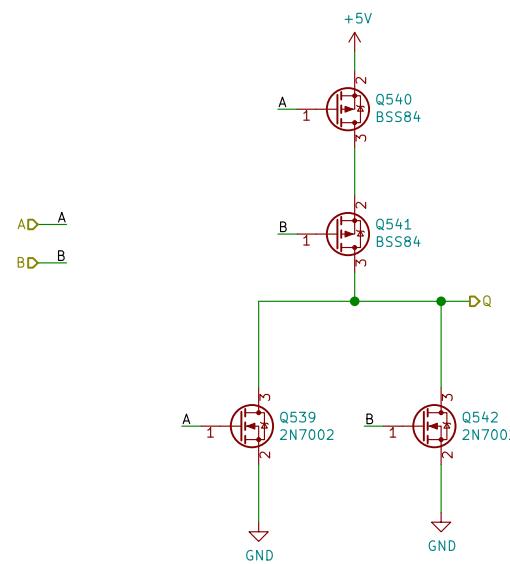
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB1A8A/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 136/362

A

A

B

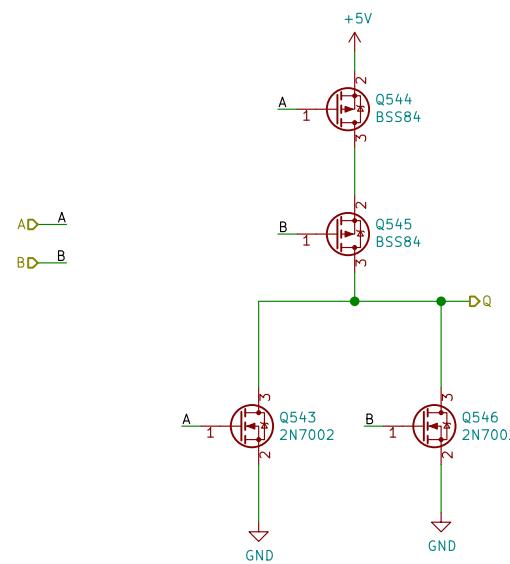
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB040A/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 137/362

A

A

B

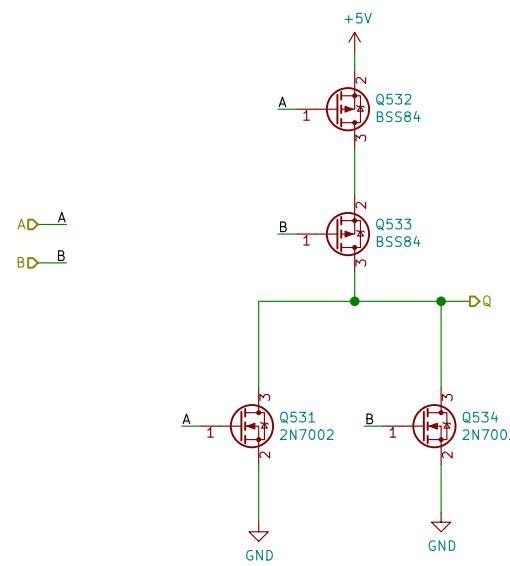
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Draw\_Detect/sheet5EDB1A88/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

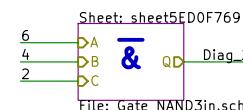
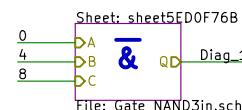
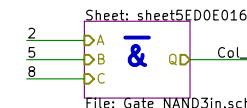
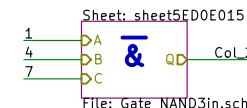
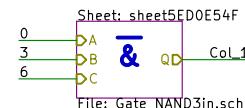
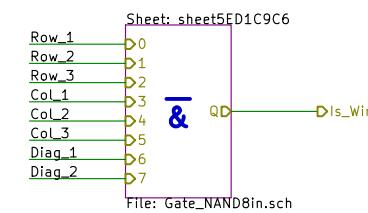
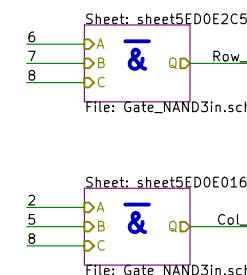
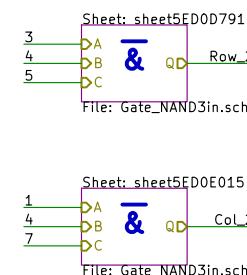
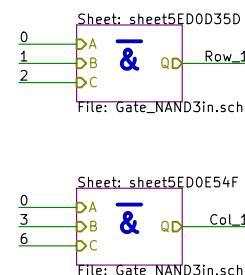
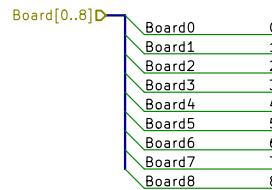
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 138/362

1 2 3 4 5 6

Checks if a Player has won by AND-ing all Rows, Cols, and Diags individually



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /EndState\_Detect/Win\_Detect\_P2/  
 File: Win\_Detect.sch

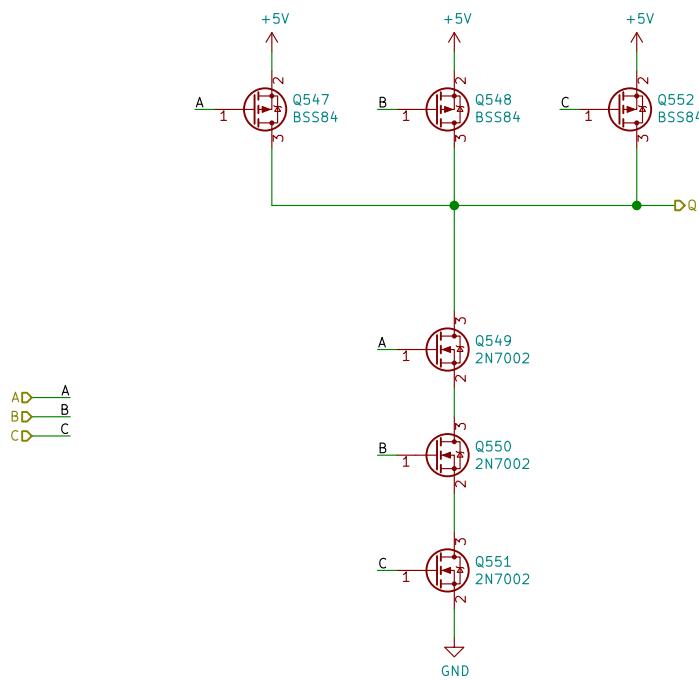
### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 139/362

1 2 3 4 5 6

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0D35D/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

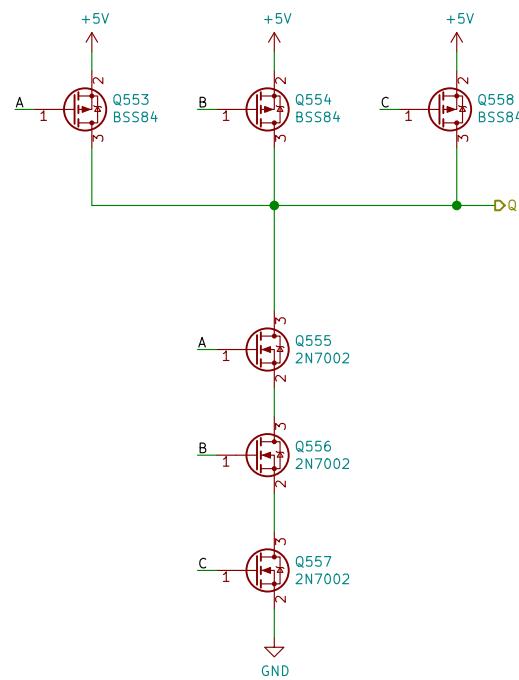
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 140/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0D791/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

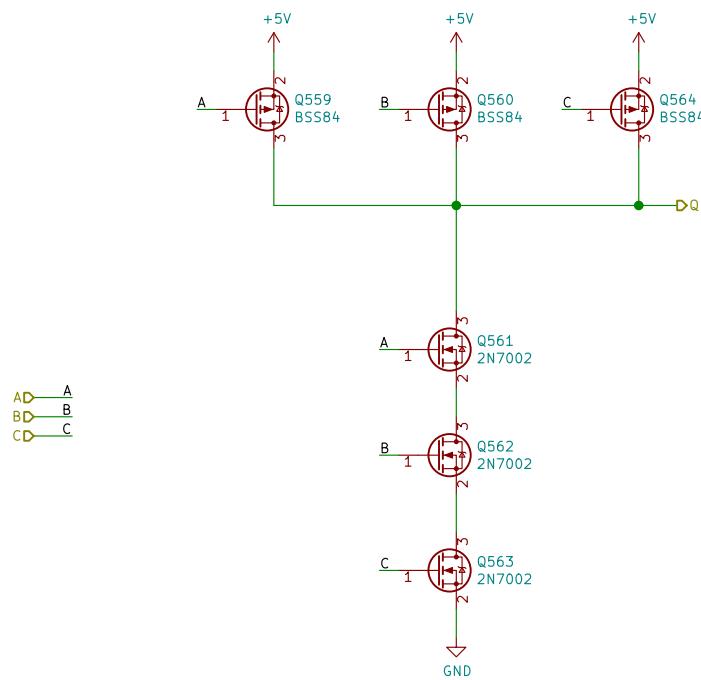
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 141/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0E015/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

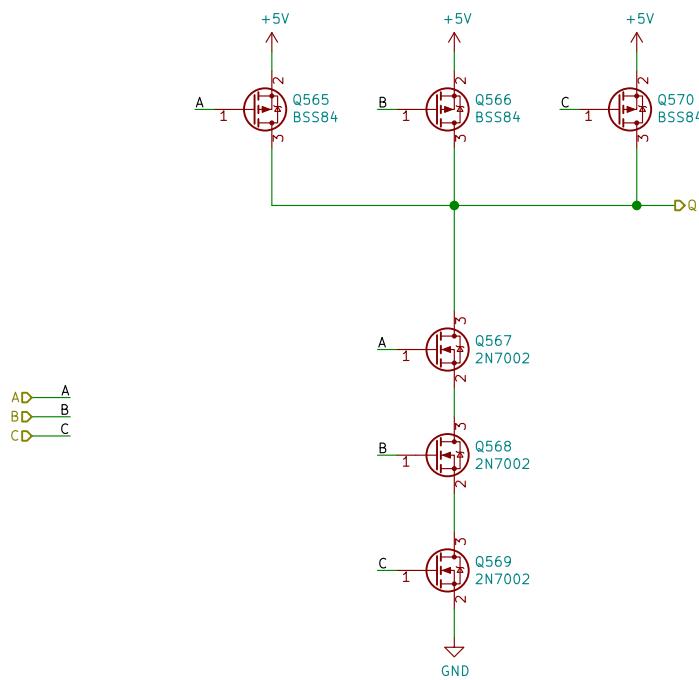
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 142/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0E016/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

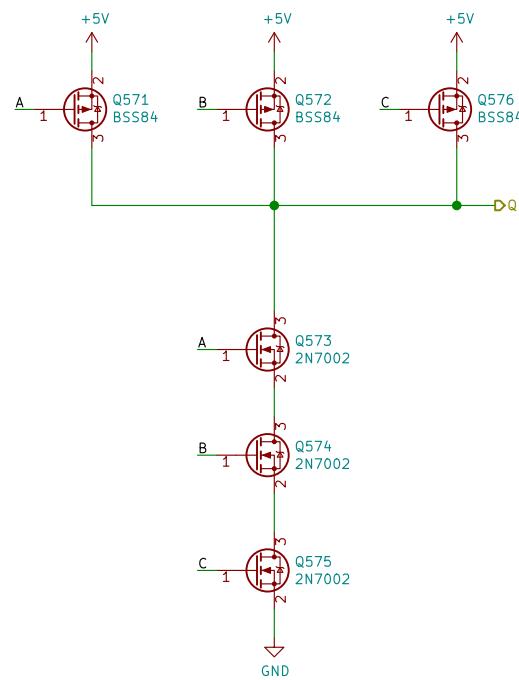
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 143/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0E2C5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

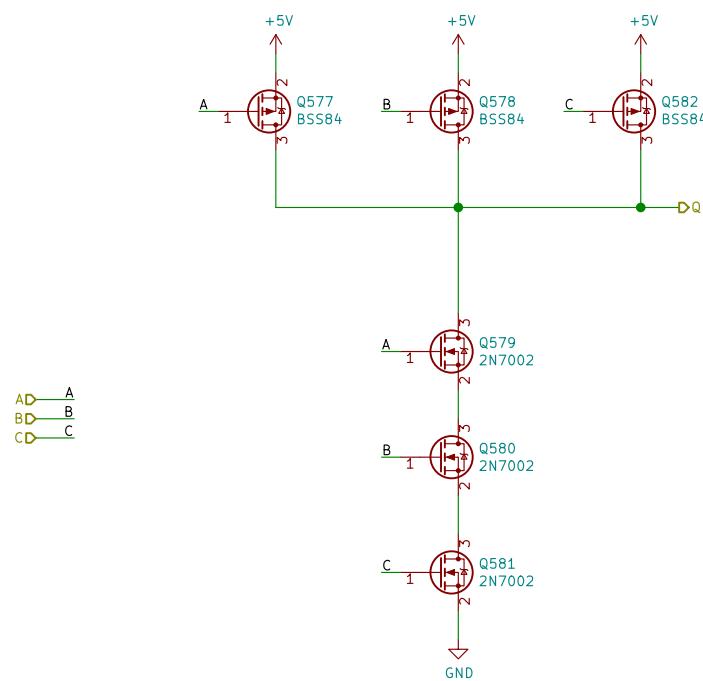
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 144/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0E54F/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

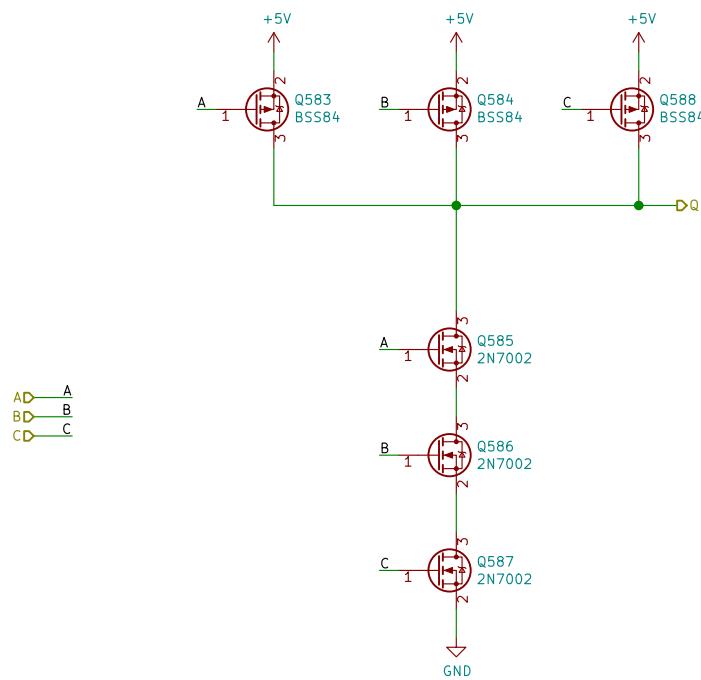
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 145/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0F769/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

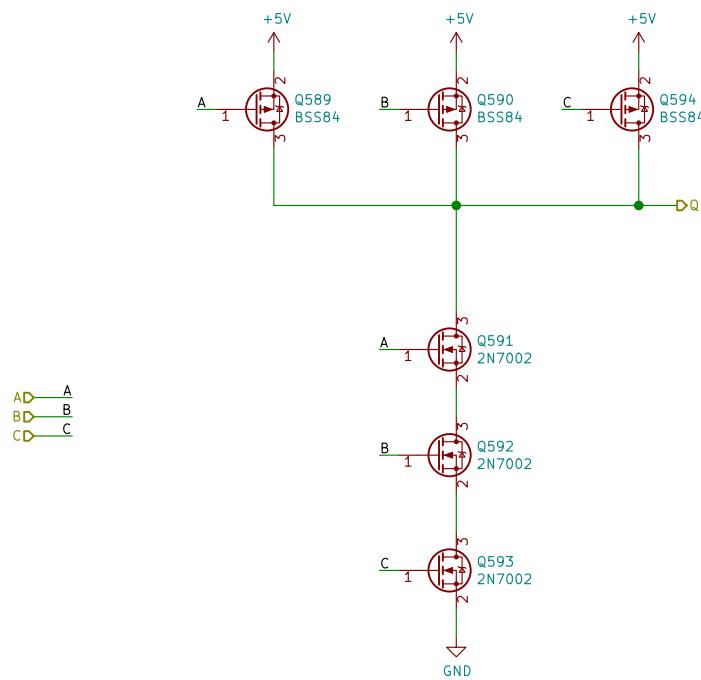
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 146/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/Win\_Detect\_P2/sheet5ED0F76B/

File: Gate\_NAND3in.sch

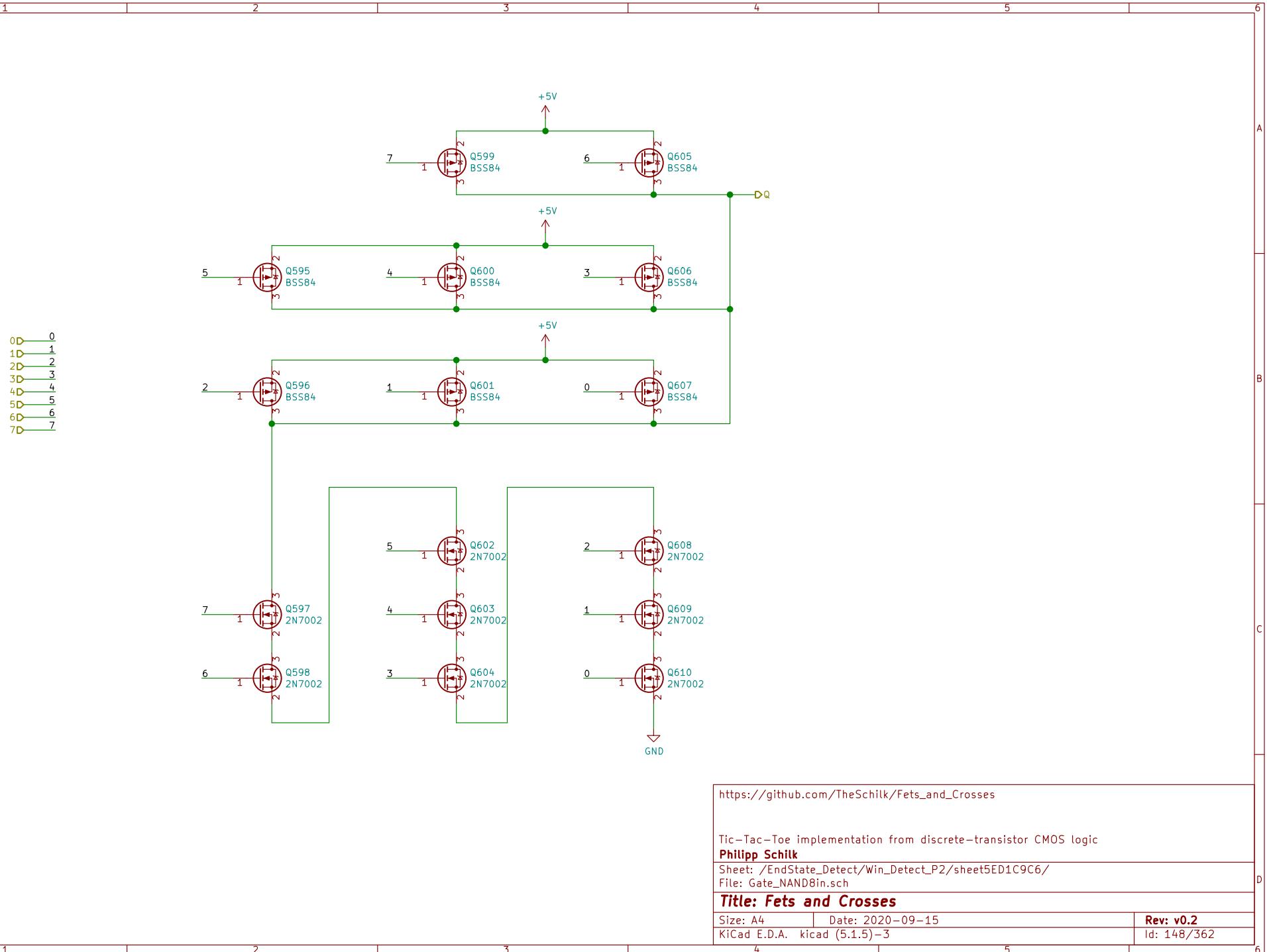
**Title: Fets and Crosses**

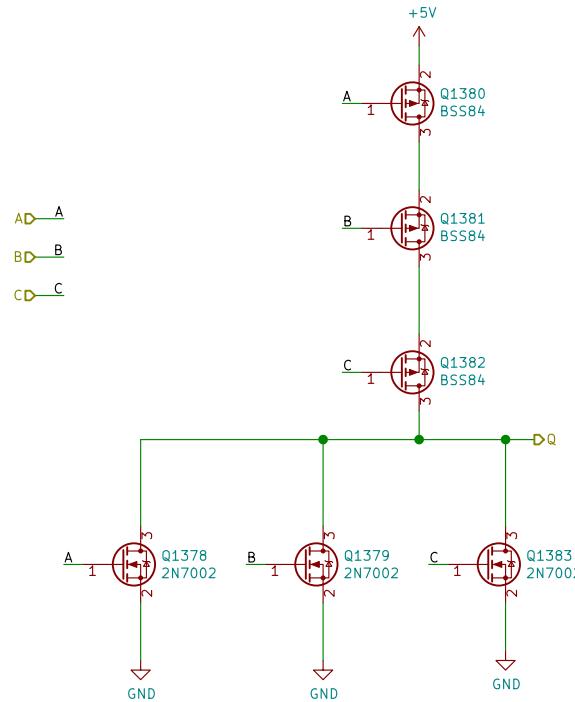
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 147/362





[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /EndState\_Detect/sheet5F618C3B/

File: Gate\_NOR3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 149/362

A

B

C

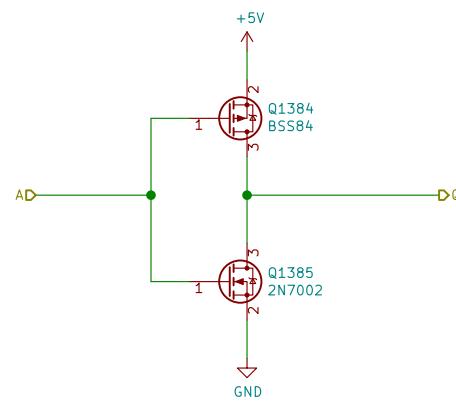
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /EndState\_Detect/sheet5F619E8D/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

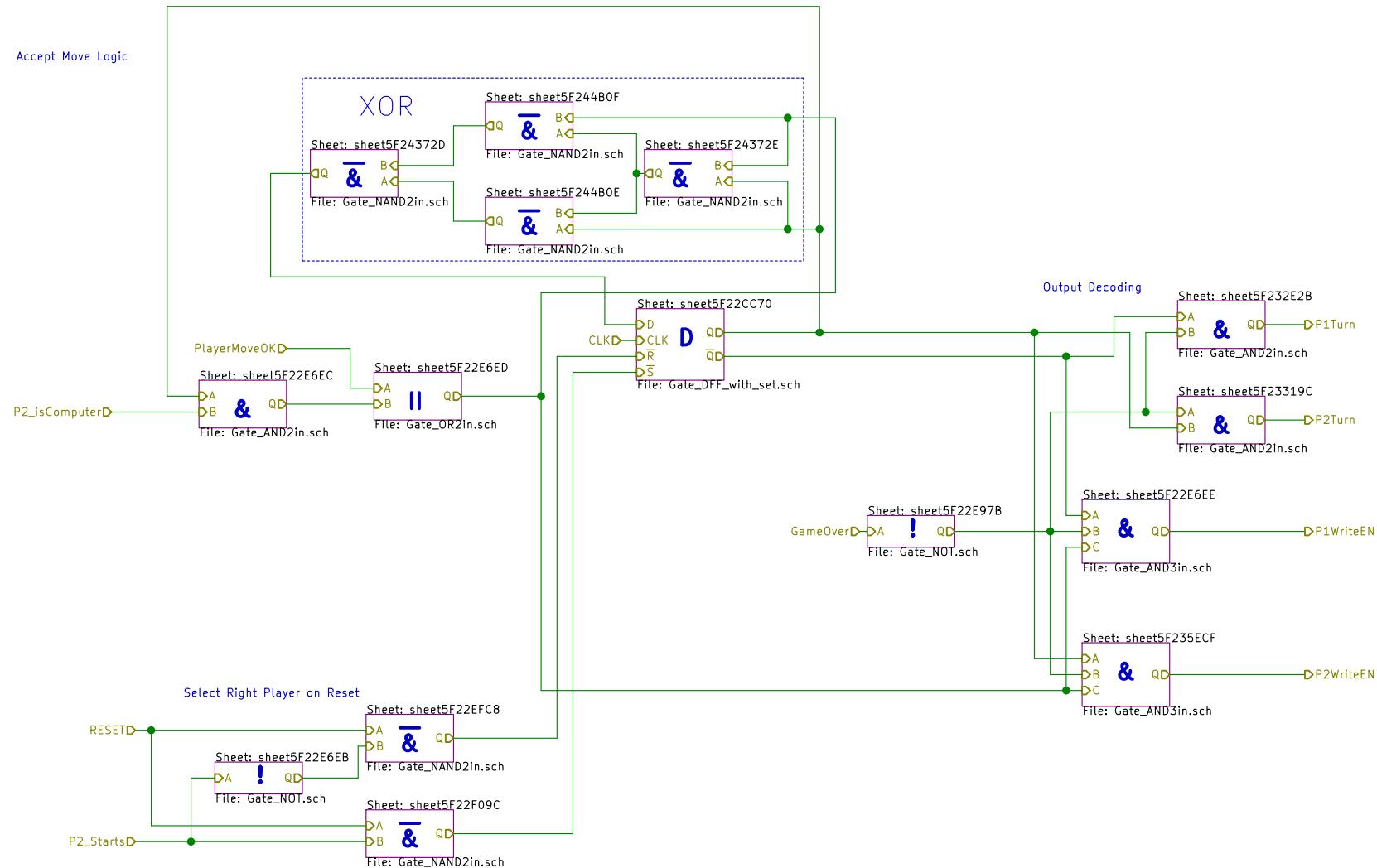
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 150/362

## Accept Move Logic



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/  
File: StateMaschine.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 151/362

A

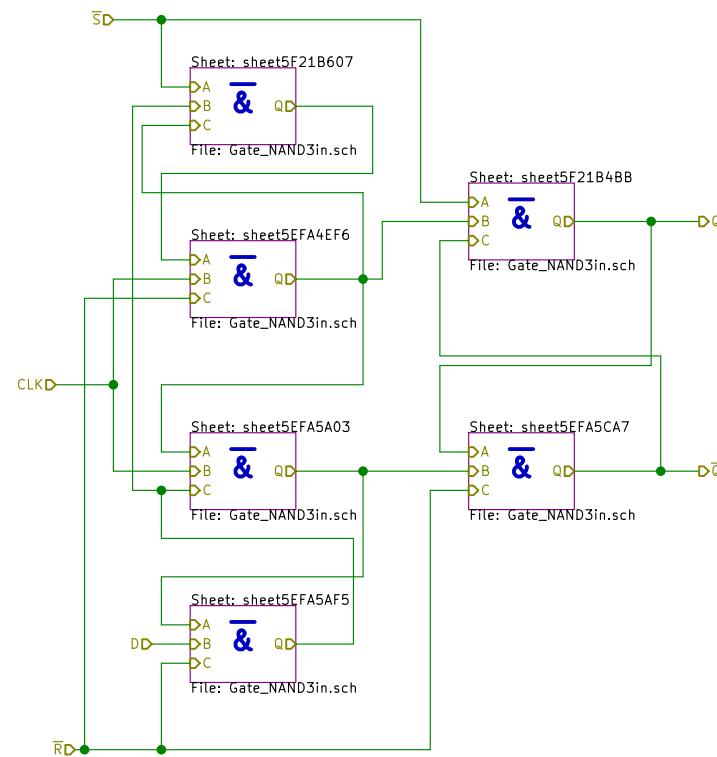
A

B

B

C

C



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

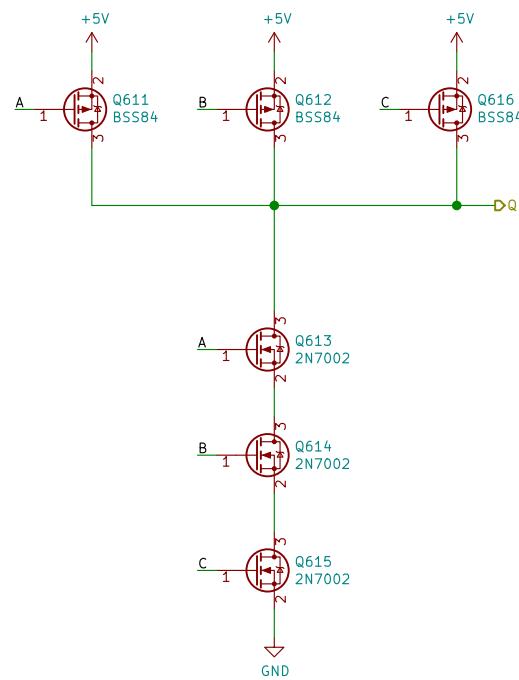
Sheet: /StateMaschine/sheet5F22CC70/  
File: Gate\_DFF\_with\_set.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 152/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 153/362

A

A

B

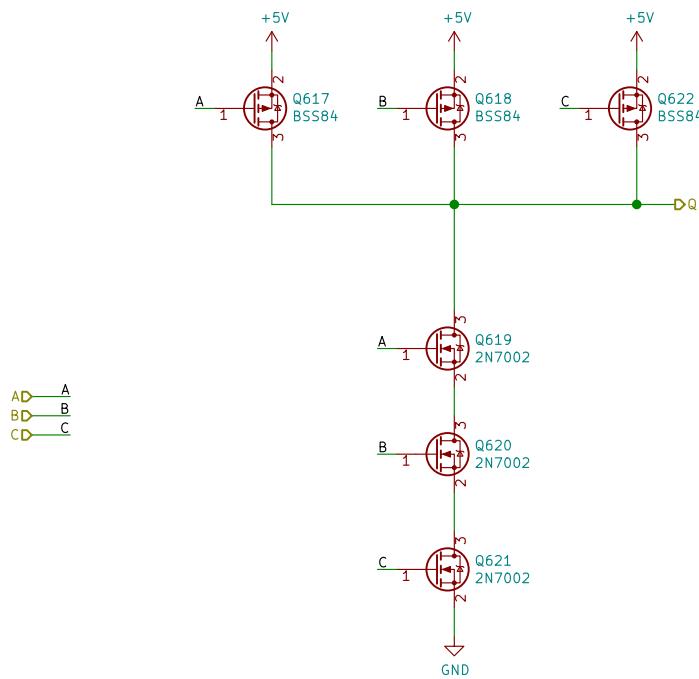
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 154/362

A

A

B

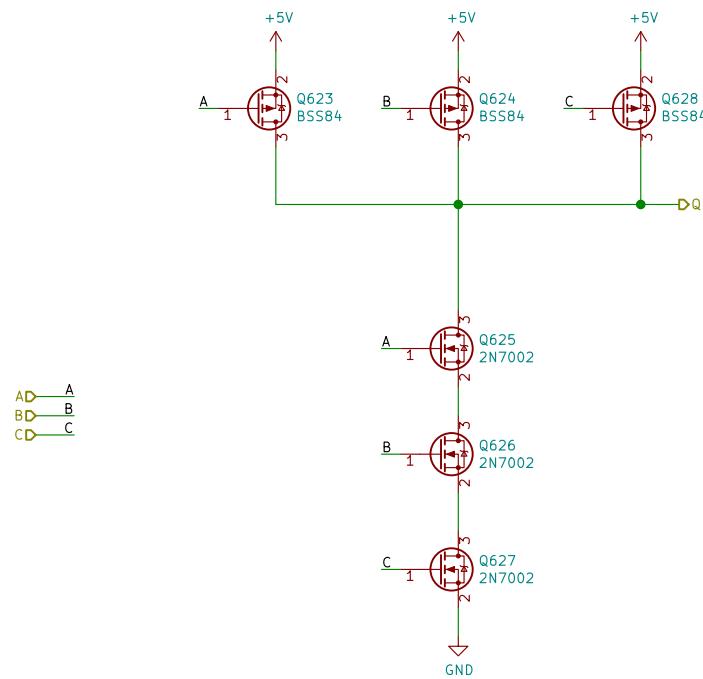
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 155/362

A

A

B

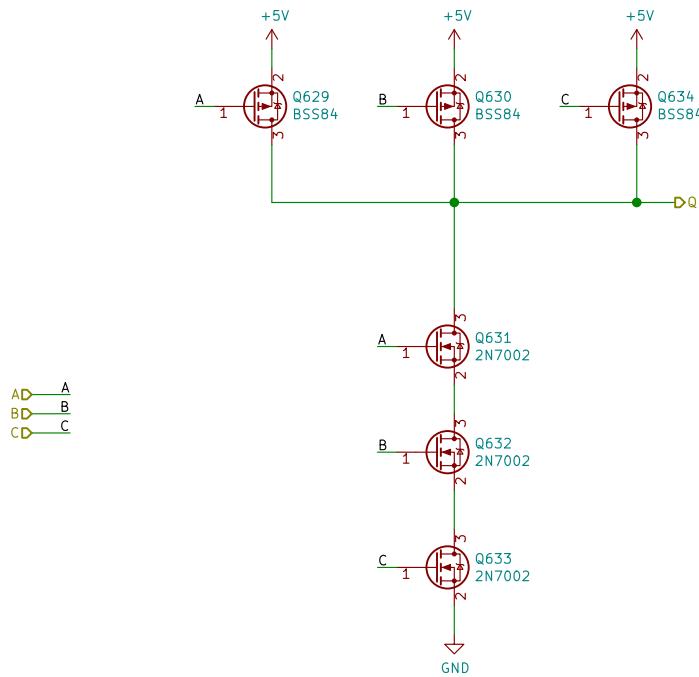
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 156/362

A

A

B

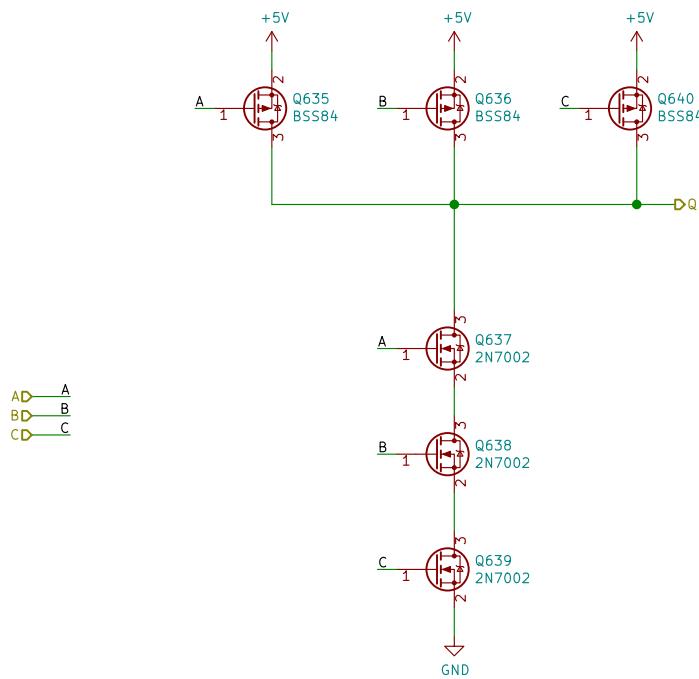
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5F21B4BB/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 157/362

A

A

B

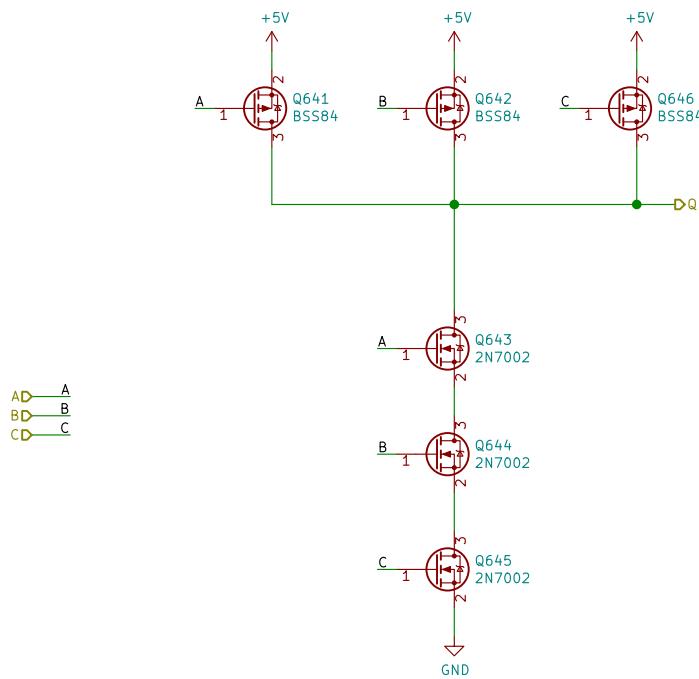
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22CC70/sheet5F21B607/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 158/362

A

B

C

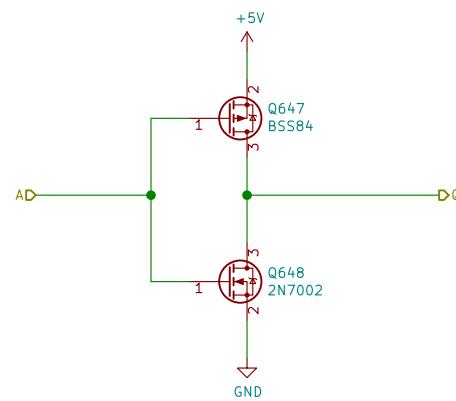
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6EB/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 159/362

A

A

B

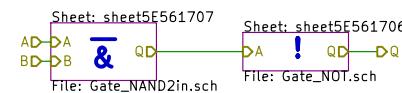
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
Philipp Schilk  
Sheet: /StateMaschine/sheet5F22E6EC/  
File: Gate\_AND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 160/362

A

B

C

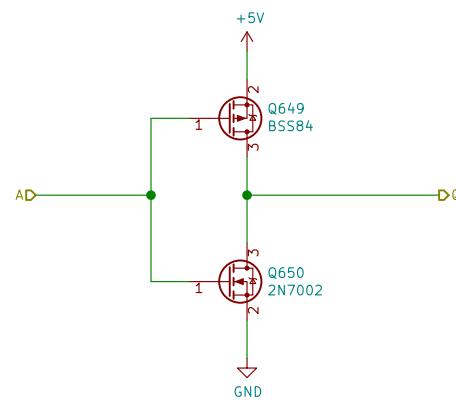
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6EC/sheet5E561706/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

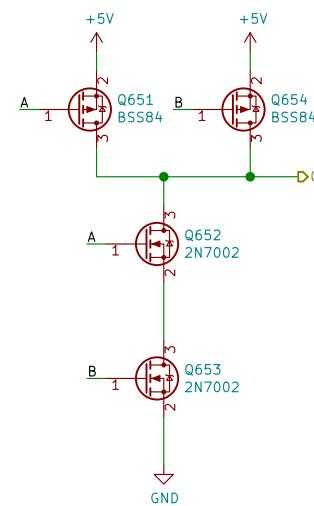
Id: 161/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6EC/sheet5E561707/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 162/362

A

A

B

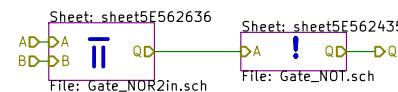
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F22E6ED/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 163/362

A

B

C

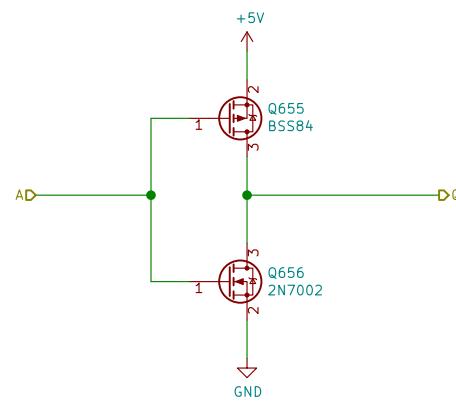
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6ED/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 164/362

A

A

B

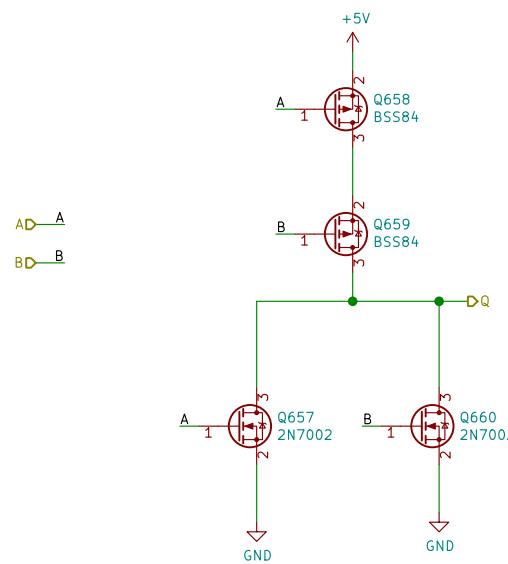
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22E6ED/sheet5E562636/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 165/362

A

B

C

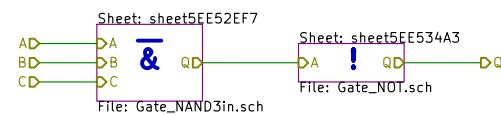
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6EE/

File: Gate\_AND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 166/362

A

A

B

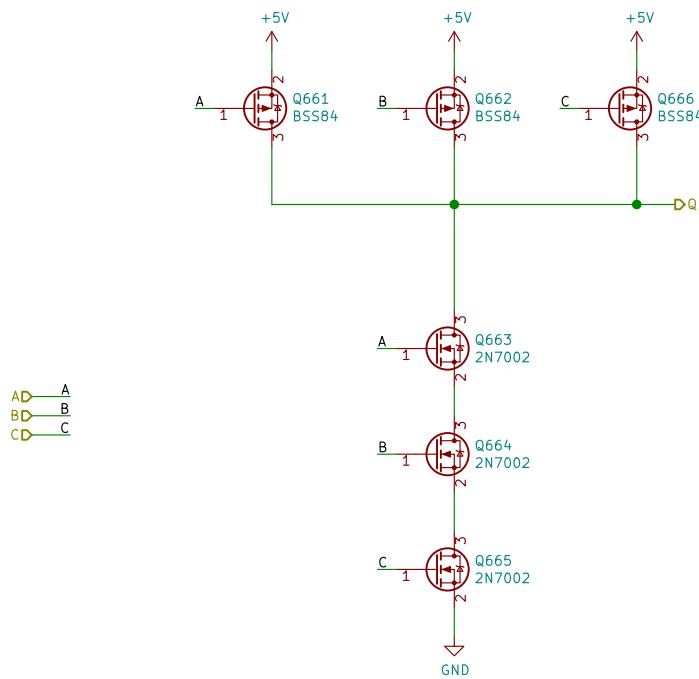
B

C

C

D

D



AD  
A  
 BD  
B  
 CD  
C

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F22E6EE/sheet5EE52EF7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 167/362

A

B

C

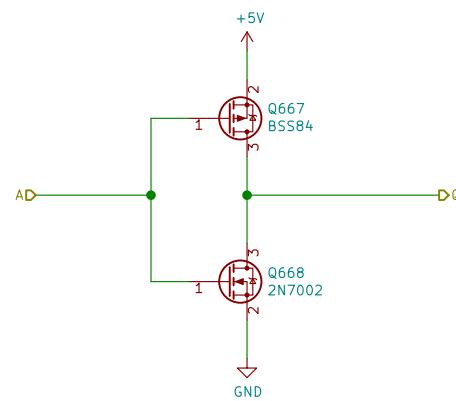
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E6EE/sheet5EE534A3/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 168/362

A

B

C

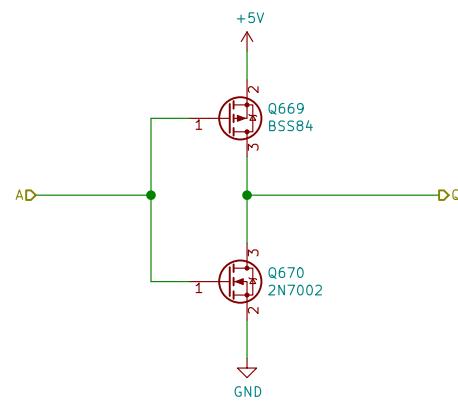
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F22E97B/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

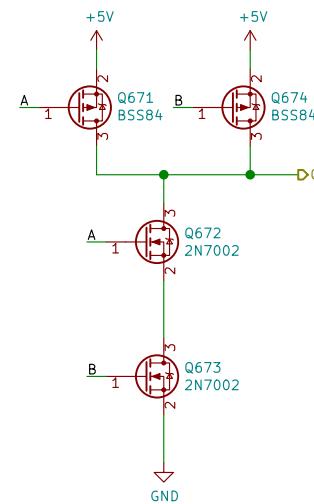
Id: 169/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F22EFC8/  
File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

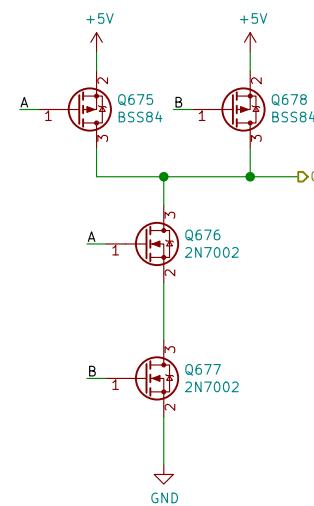
Rev: v0.2
Id: 170/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F22F09C/  
File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 171/362

A

A

B

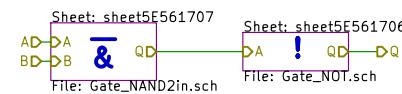
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
Philipp Schilk  
Sheet: /StateMaschine/sheet5F232E2B/  
File: Gate\_AND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 172/362

A

B

C

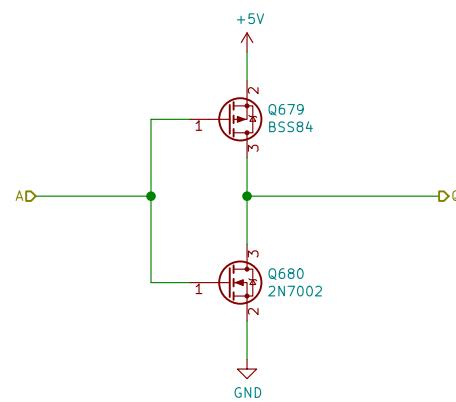
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F232E2B/sheet5E561706/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

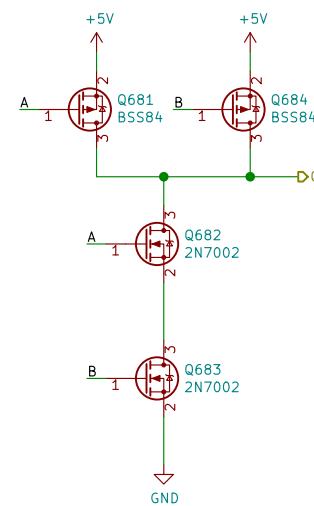
Id: 173/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /StateMaschine/sheet5F232E2B/sheet5E561707/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 174/362

A

A

B

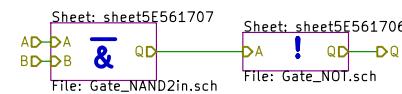
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F23319C/  
File: Gate\_AND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

<b>Rev: v0.2</b>
Id: 175/362

A

B

C

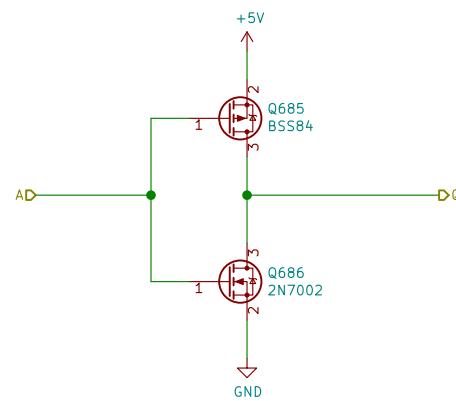
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /StateMaschine/sheet5F23319C/sheet5E561706/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

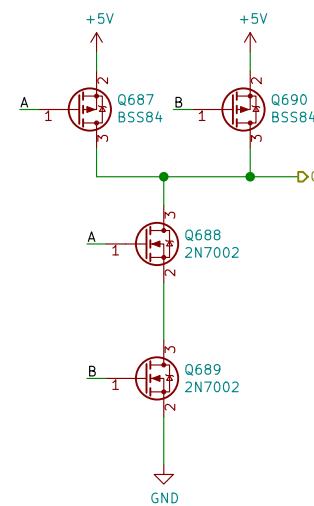
Id: 176/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F23319C/sheet5E561707/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 177/362

A

B

C

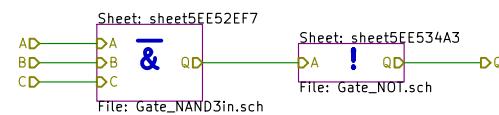
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F235ECF/  
File: Gate\_AND3in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

<b>Rev: v0.2</b>
Id: 178/362

A

A

B

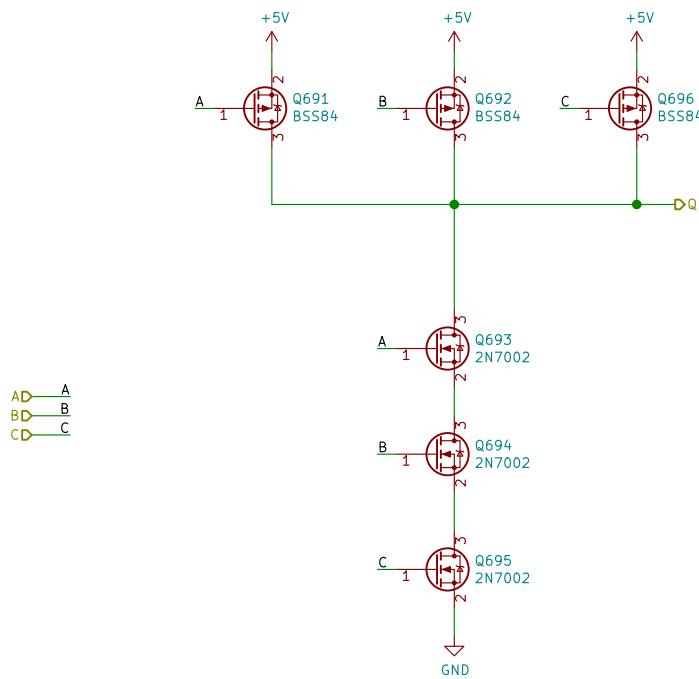
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F235ECF/sheet5EE52EF7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 179/362

A

B

C

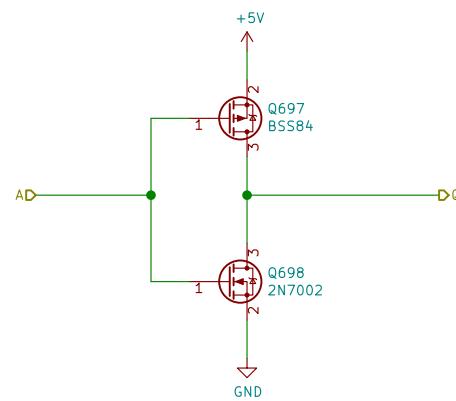
D

A

B

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /StateMaschine/sheet5F235ECF/sheet5EE534A3/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

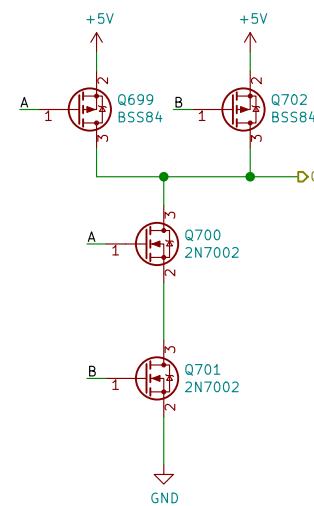
Id: 180/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F24372D/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

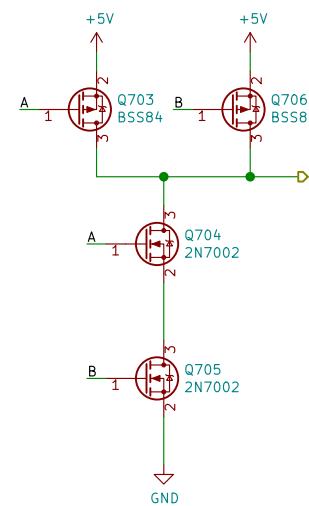
Rev: v0.2
Id: 181/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F24372E/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

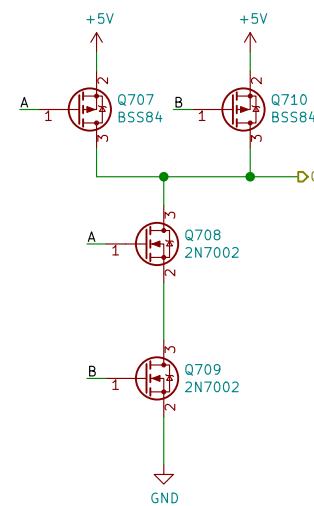
Rev: v0.2
Id: 182/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /StateMaschine/sheet5F244B0E/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
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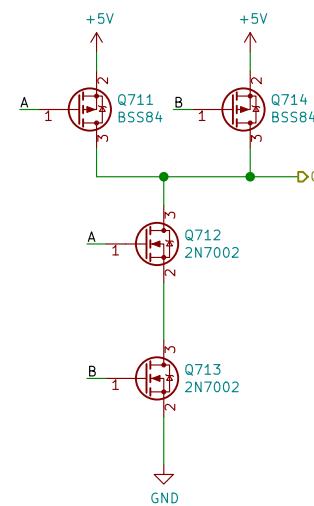
Rev: v0.2
Id: 183/362

A

B

C

D

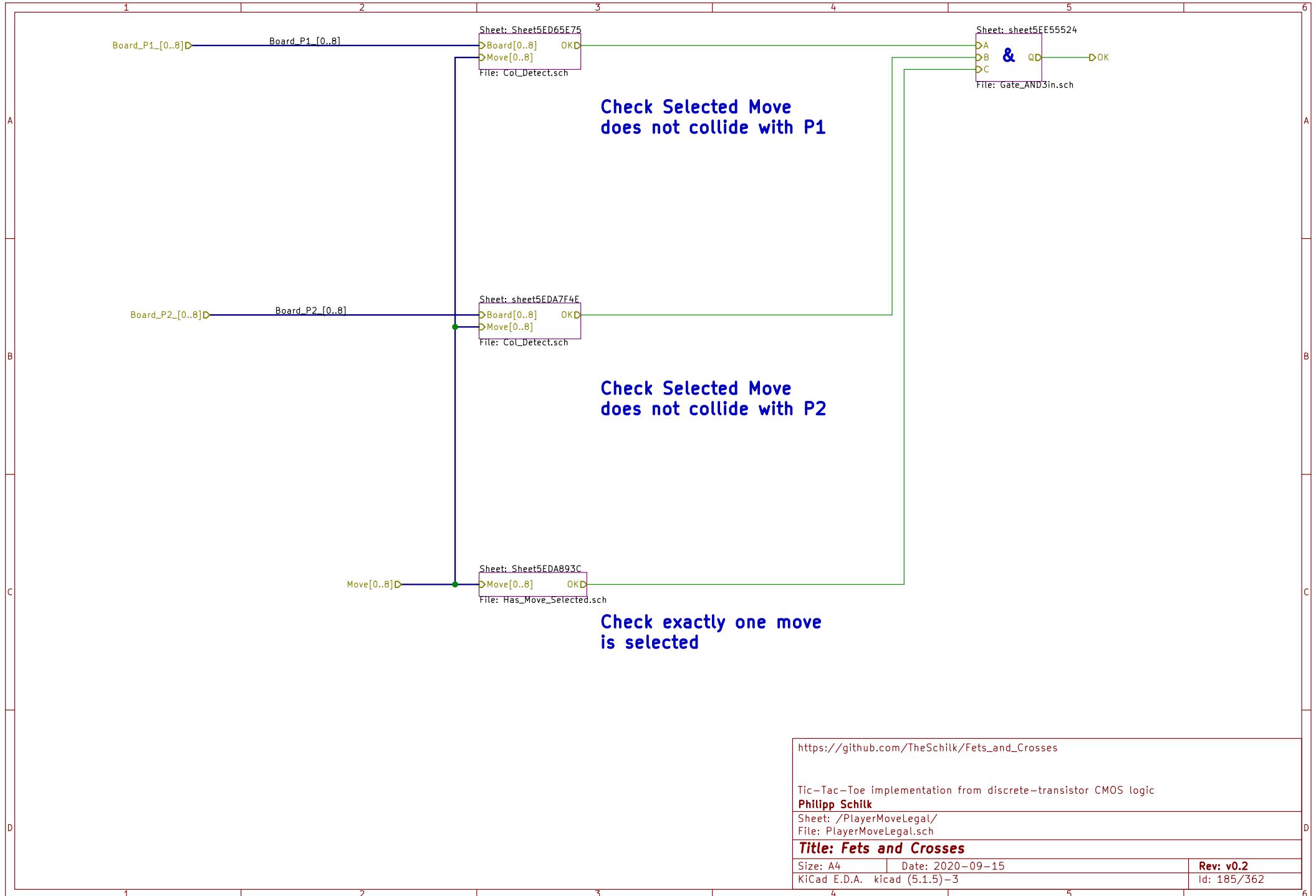
AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

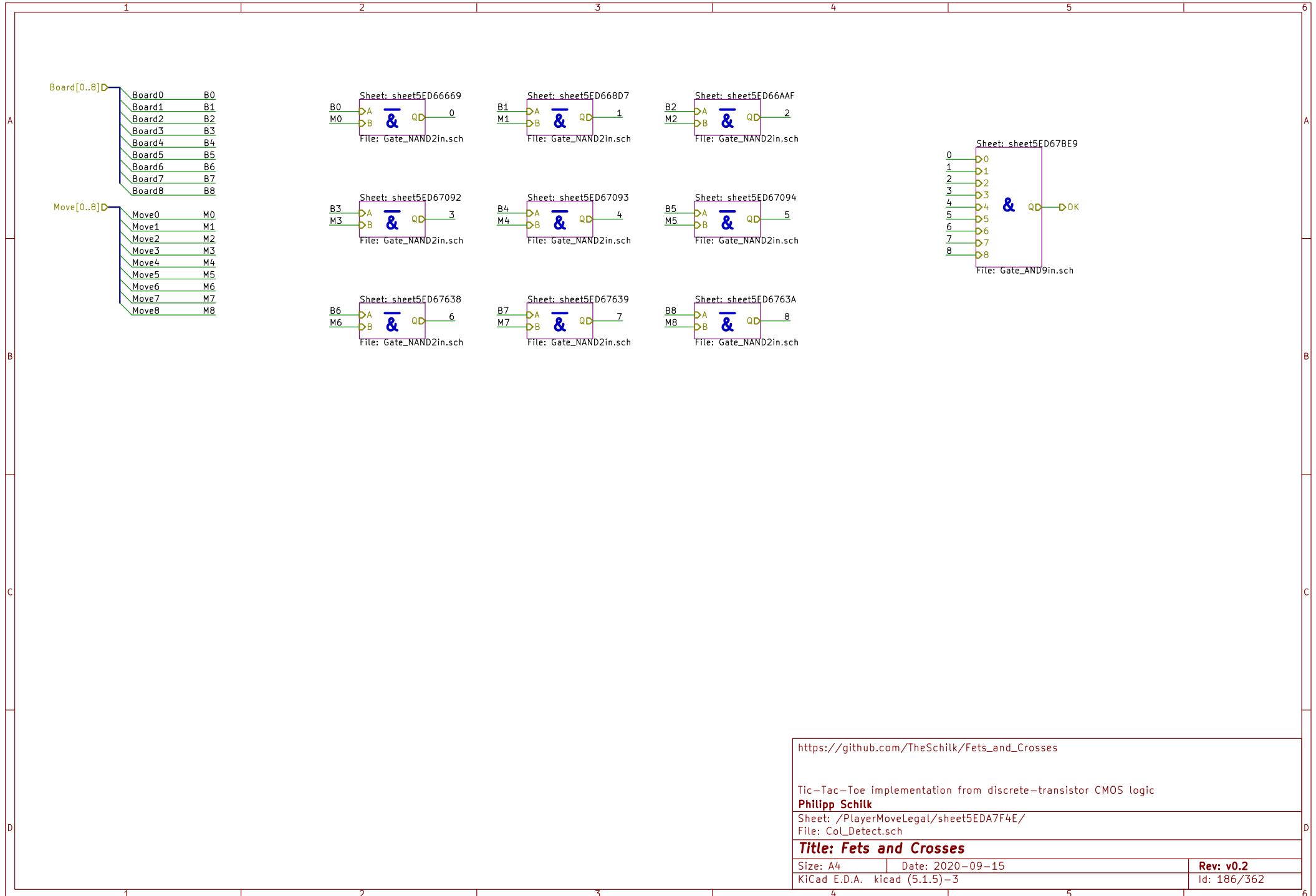
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /StateMaschine/sheet5F244B0F/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 184/362



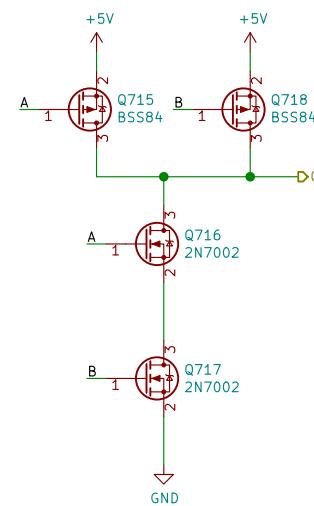


A

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED66669/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

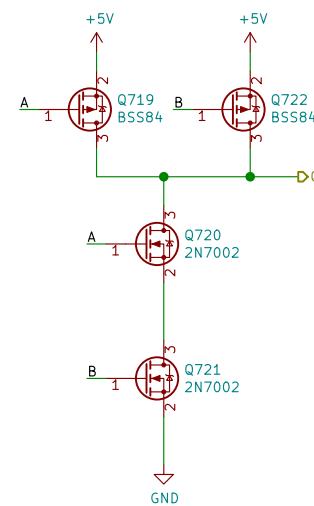
Id: 187/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED66AAF/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

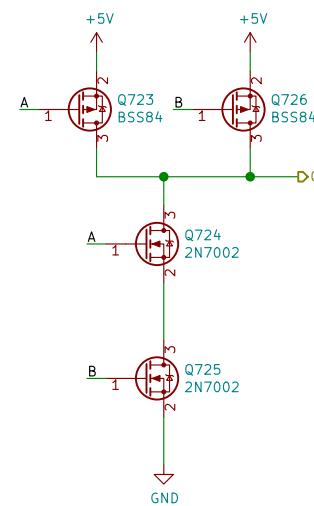
Id: 188/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67092/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

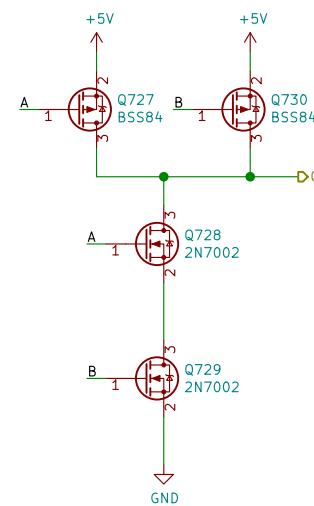
Rev: v0.2
Id: 189/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67093/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

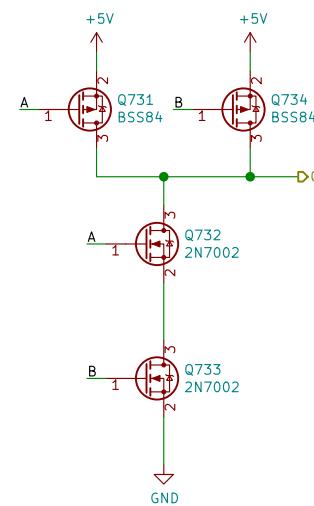
Id: 190/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67094/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

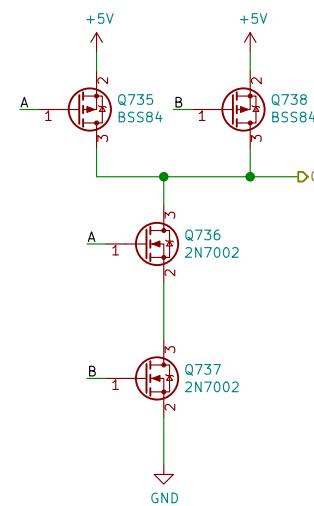
Id: 191/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67638/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

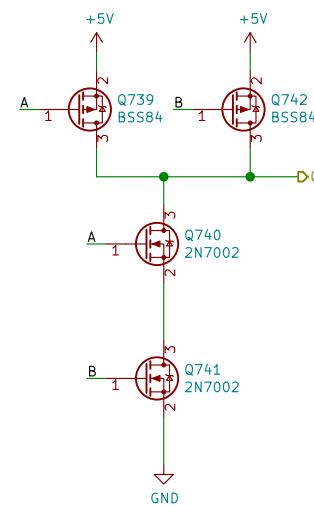
Rev: v0.2
Id: 192/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67639/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

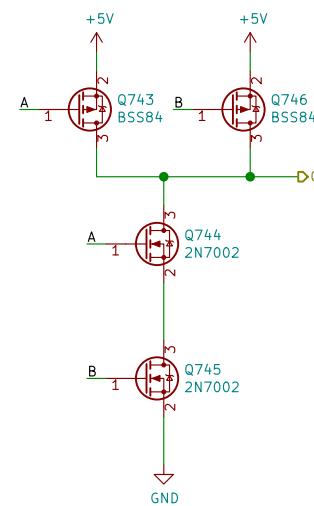
Id: 193/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED6763A/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 194/362

A

A

B

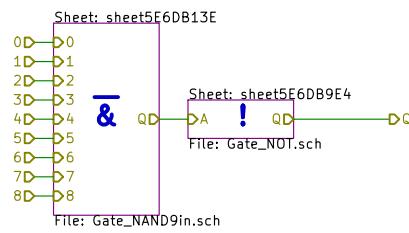
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67BE9/  
File: Gate\_AND9in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 195/362

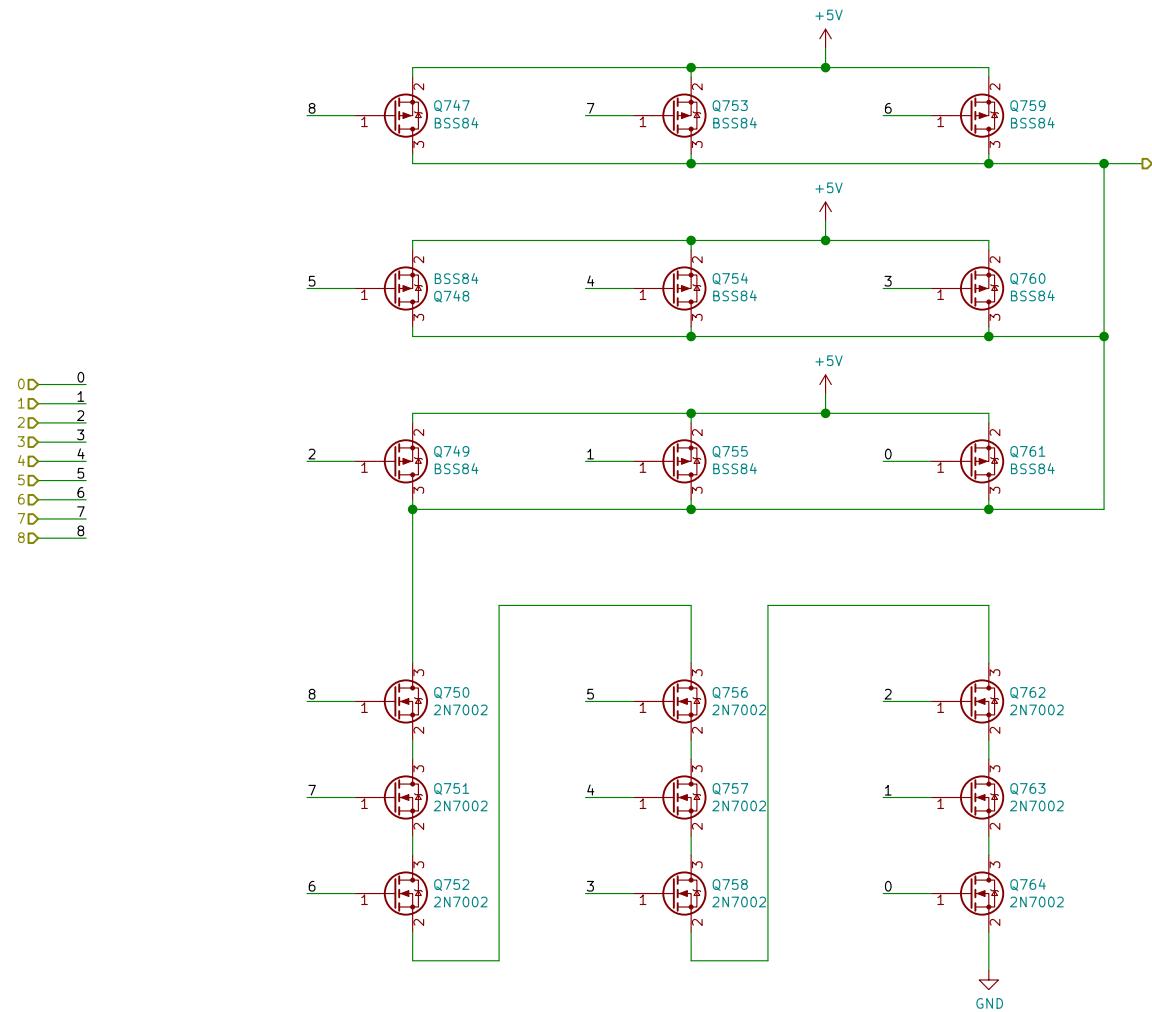
1 2 3 4 5 6

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67BE9/sheet5E6DB13E/

File: Gate\_NAND9in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 196/362

1 2 3 4 5 6

A

B

C

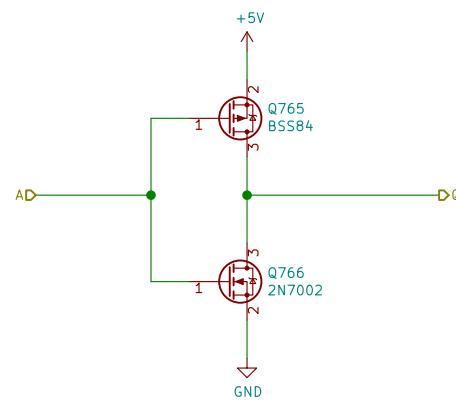
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED67BE9/sheet5E6DB9E4/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

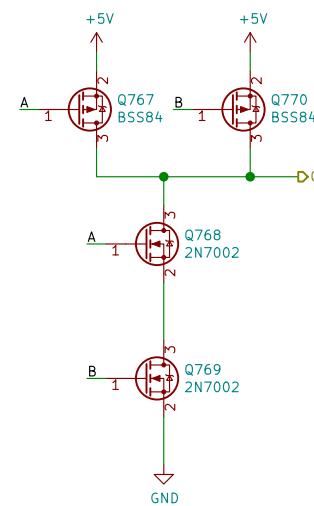
Id: 197/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EDA7F4E/sheet5ED668D7/

File: Gate\_NAND2in.sch

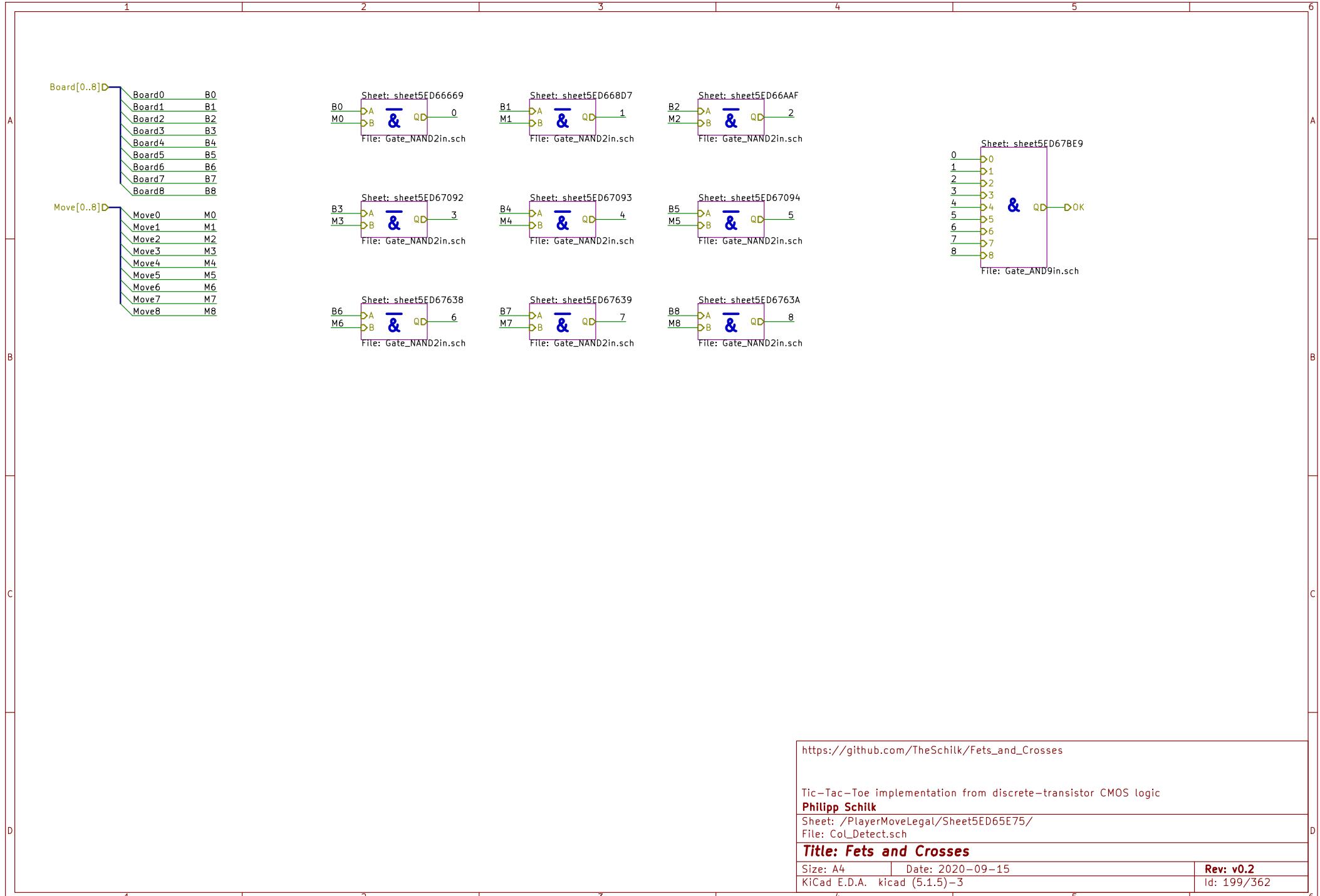
**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 198/362

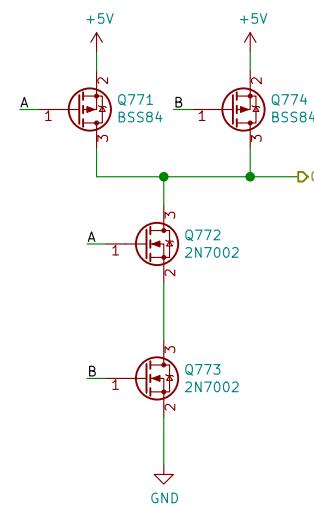


A

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED66669/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

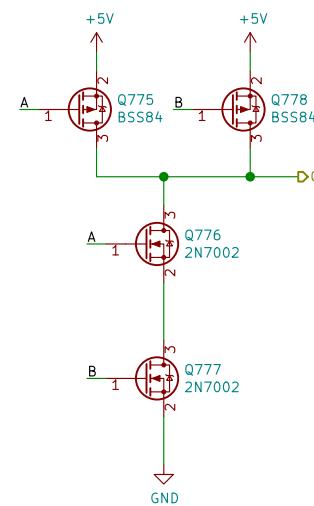
Id: 200/362
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A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED66AAF/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

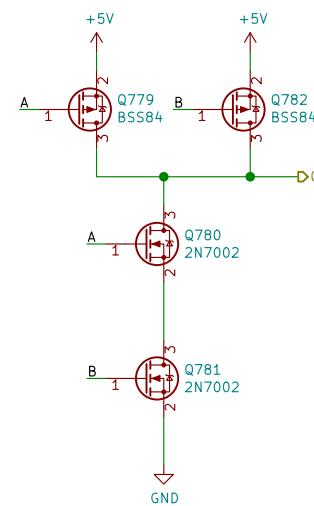
Rev: v0.2
Id: 201/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67092/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

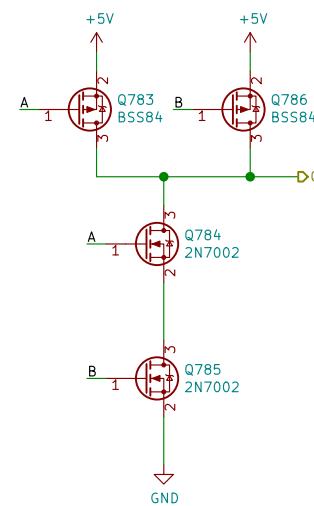
Rev: v0.2
Id: 202/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67093/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

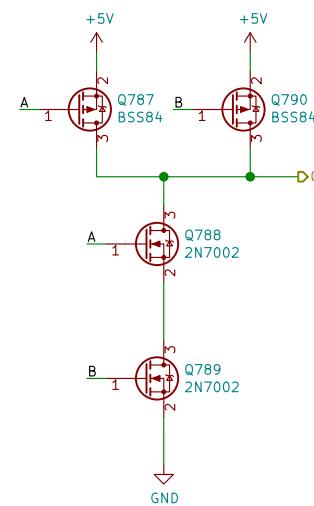
Id: 203/362
-------------

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67094/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

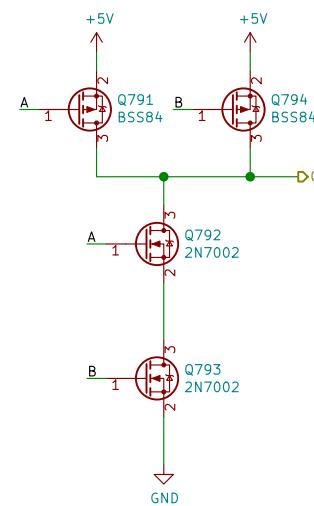
Id: 204/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67638/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
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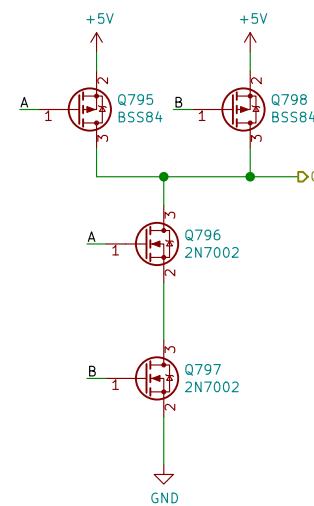
Rev: v0.2
Id: 205/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67639/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

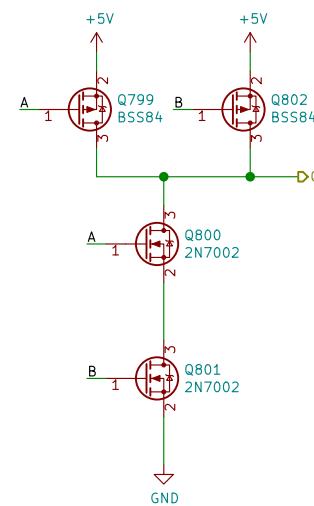
Id: 206/362
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A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED6763A/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 207/362

A

A

B

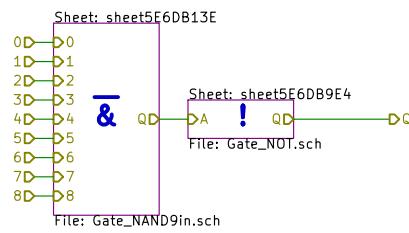
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67BE9/  
File: Gate\_AND9in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 208/362

A

B

C

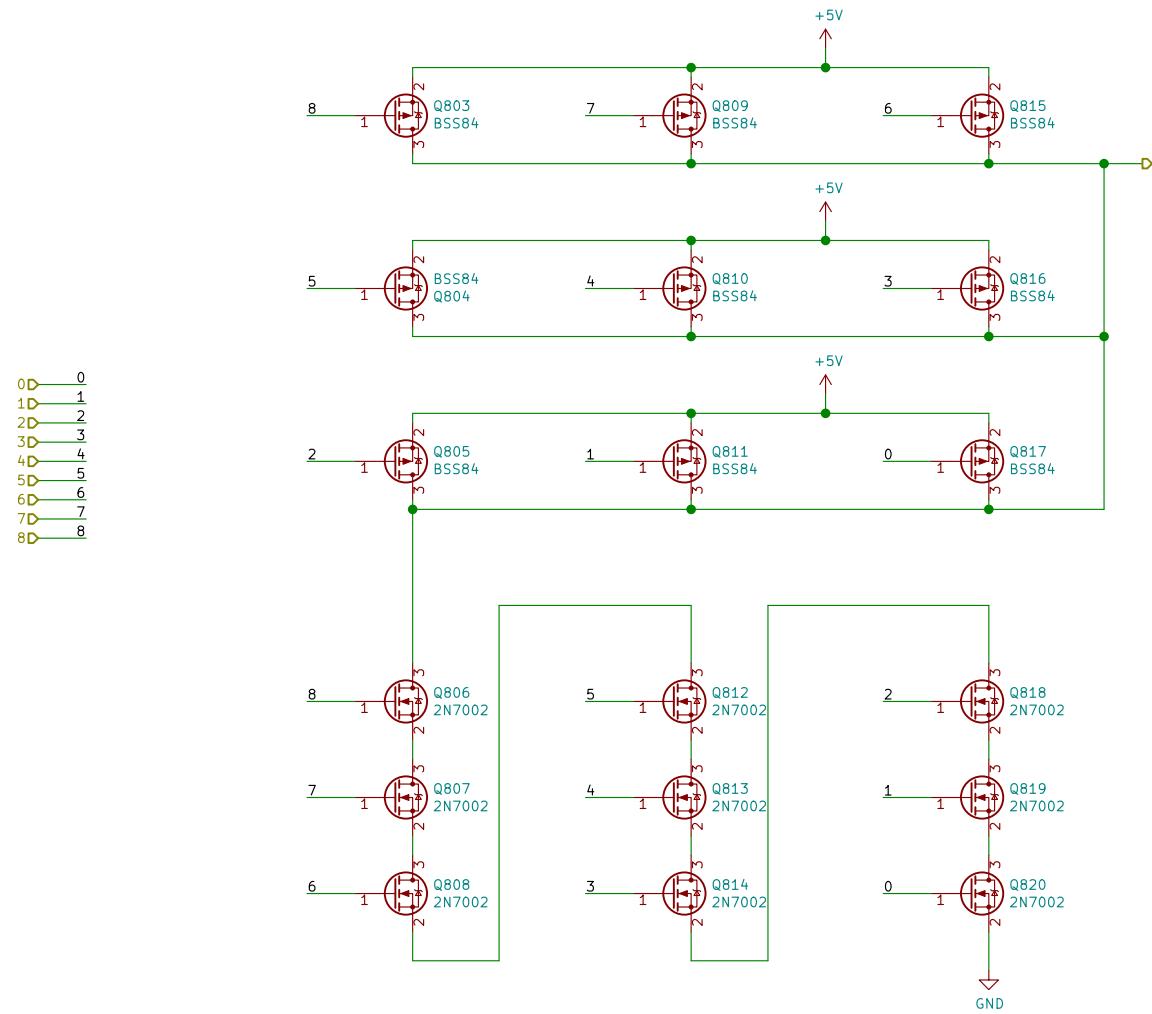
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67BE9/sheet5E6DB13E/

File: Gate\_NAND9in.sch

Title: Fets and Crosses

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 209/362

A

B

C

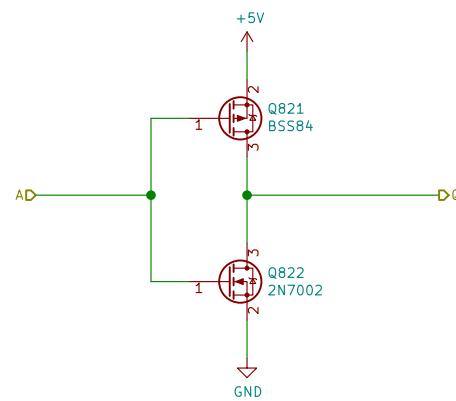
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED67BE9/sheet5E6DB9E4/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

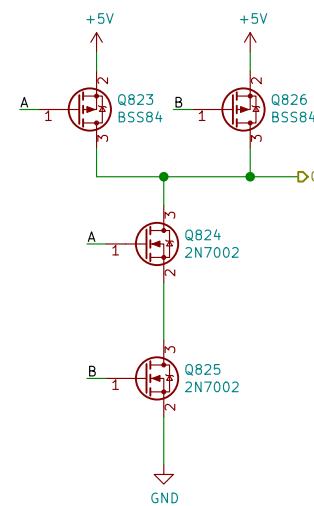
Id: 210/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5ED65E75/sheet5ED668D7/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 211/362

A

B

C

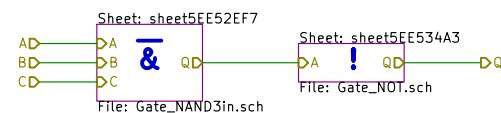
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

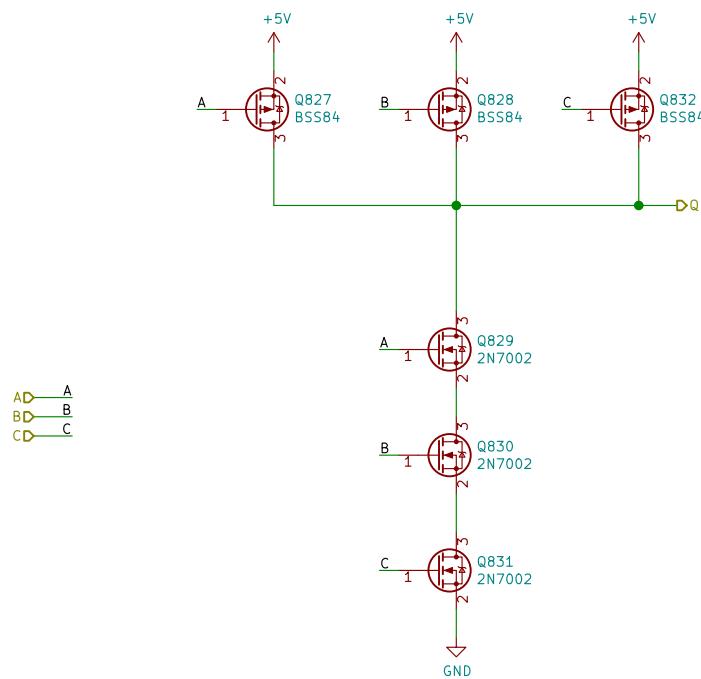
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File: Gate\_AND3in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

<b>Rev: v0.2</b>
Id: 212/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EE55524/sheet5EE52EF7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 213/362

A

B

C

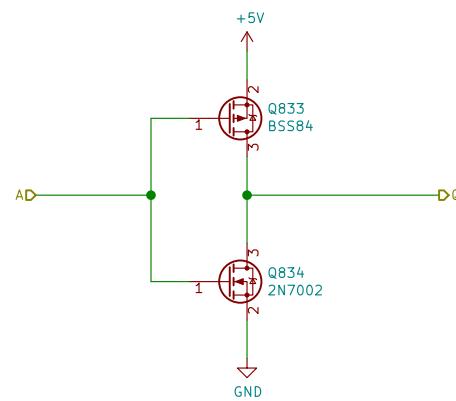
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/sheet5EE55524/sheet5EE534A3/

File: Gate\_NOT.sch

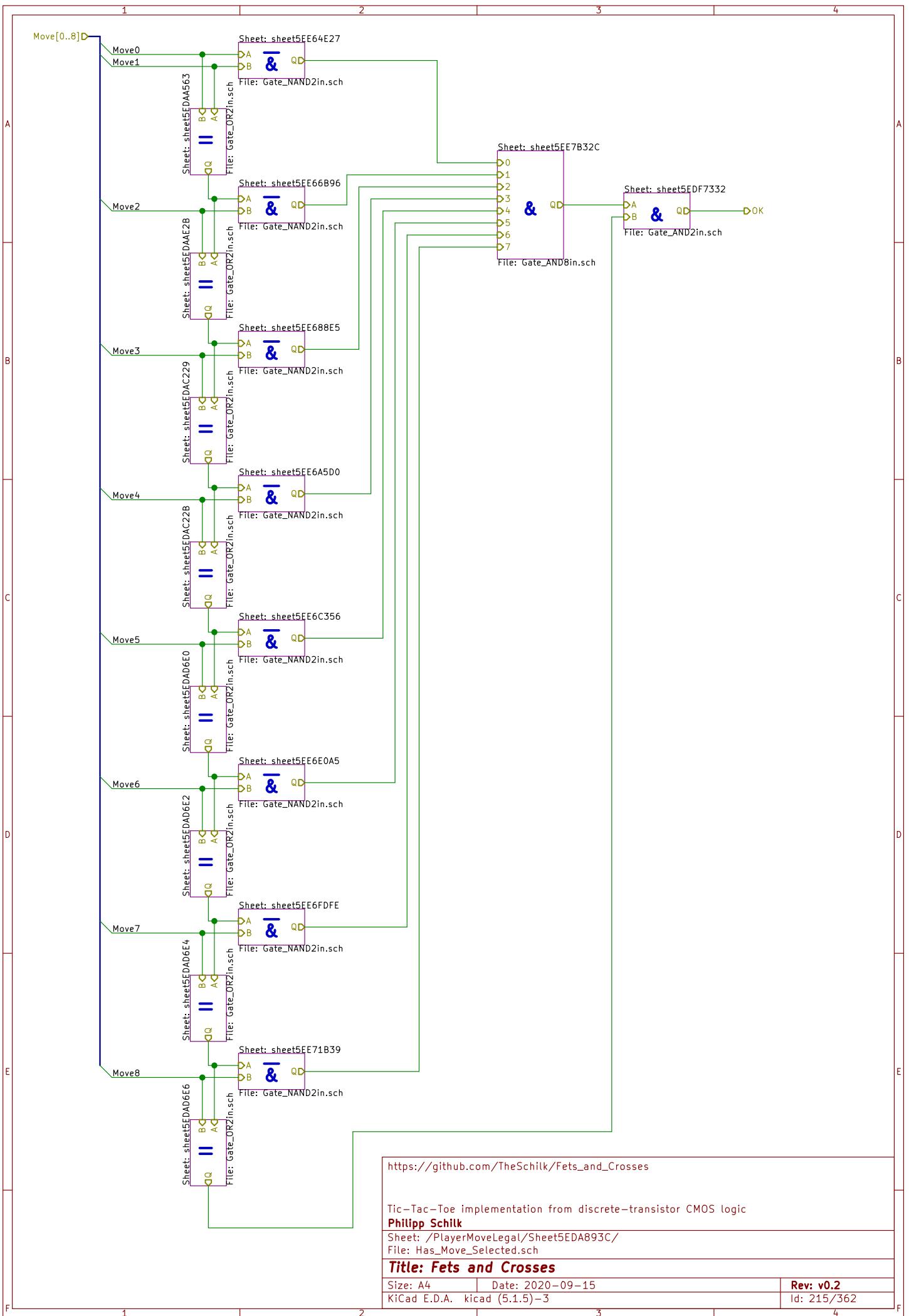
**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 214/362



A

A

B

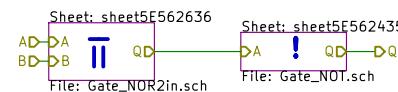
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAAE2B/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 216/362

A

B

C

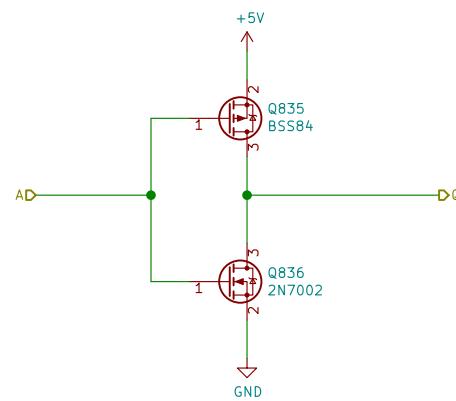
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAAE2B/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 217/362

A

A

B

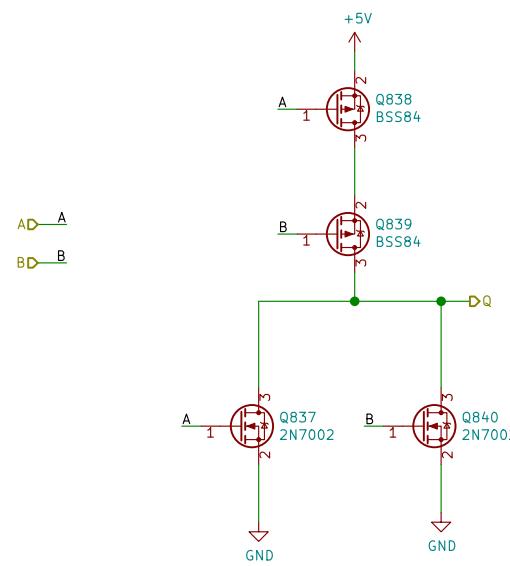
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAAE2B/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 218/362

A

A

B

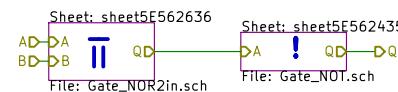
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC229/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 219/362

A

B

C

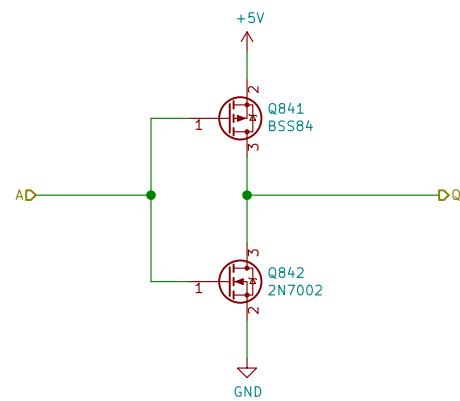
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC229/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 220/362

A

A

B

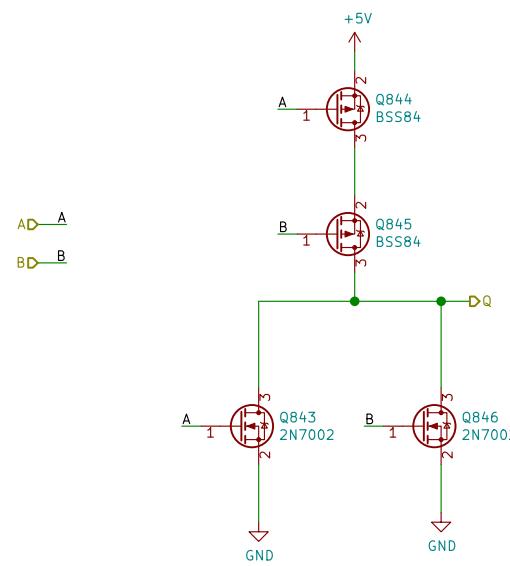
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC229/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 221/362

A

A

B

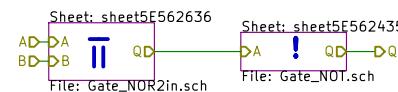
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC22B/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 222/362

A

B

C

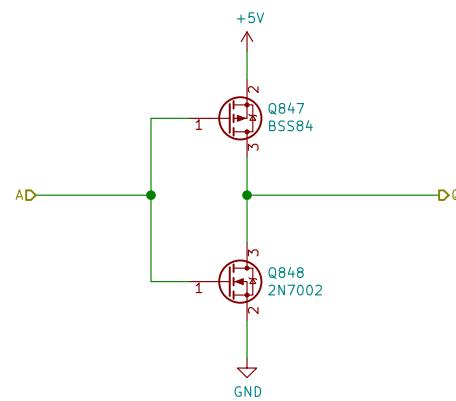
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC22B/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 223/362

A

A

B

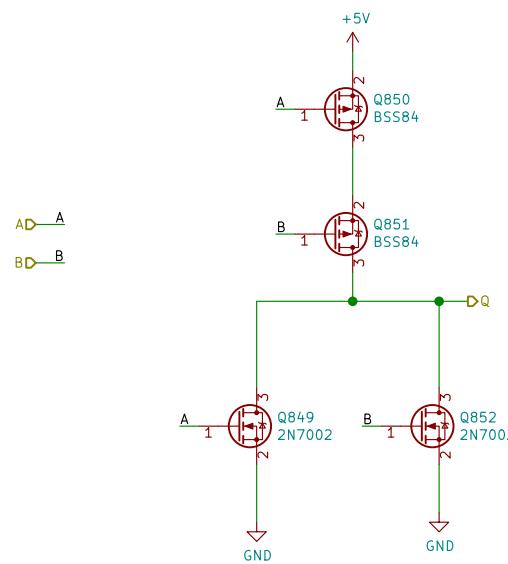
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAC22B/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 224/362

A

A

B

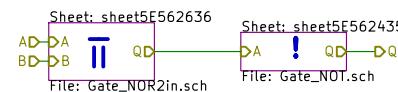
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E0/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 225/362

A

B

C

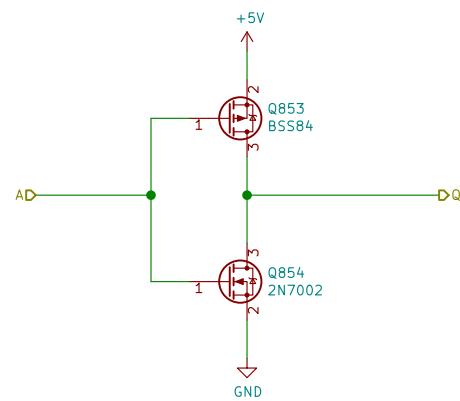
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E0/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 226/362

A

A

B

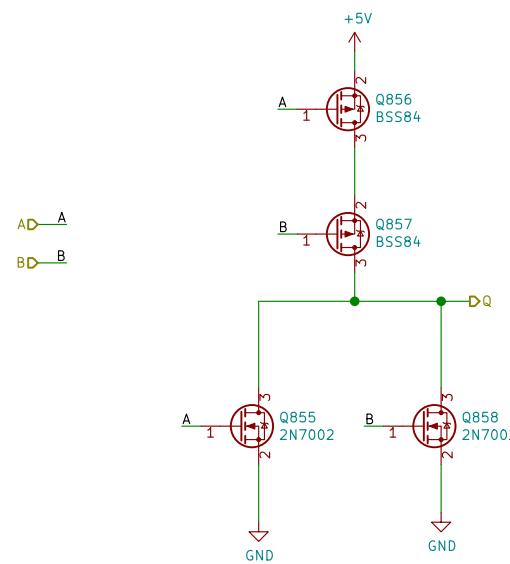
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E0/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 227/362

A

A

B

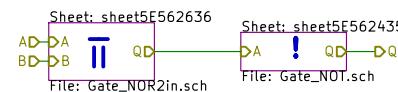
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E2/  
File: Gate\_OR2in.sch**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 228/362

A

B

C

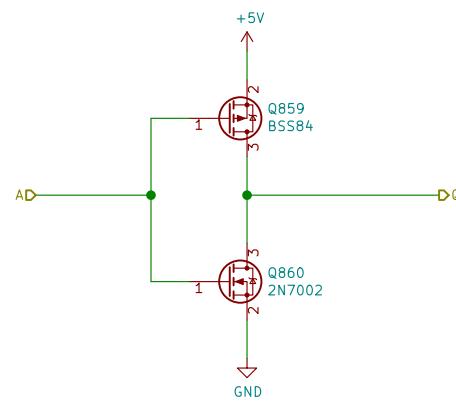
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E2/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 229/362

A

A

B

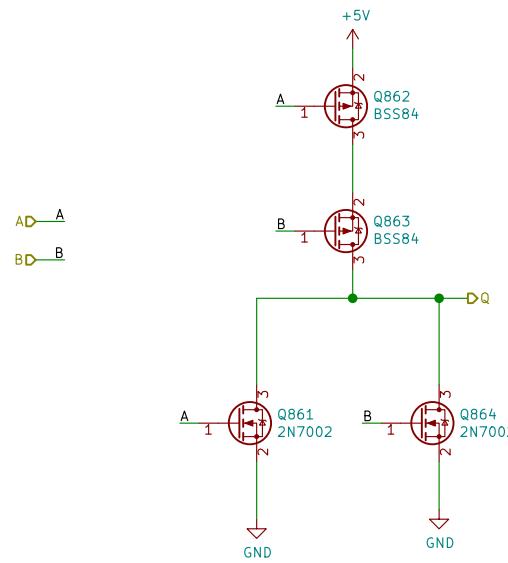
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E2/sheet5E562636/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 230/362

A

A

B

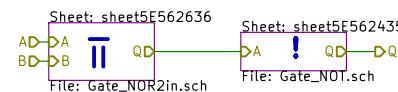
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E4/  
File: Gate\_OR2in.sch**Title: Fets and Crosses**Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3Rev: v0.2  
Id: 231/362

A

B

C

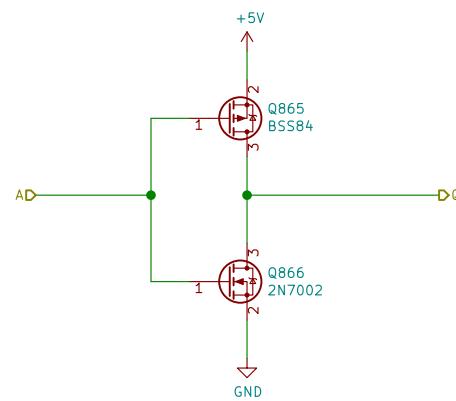
D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E4/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 232/362

A

A

B

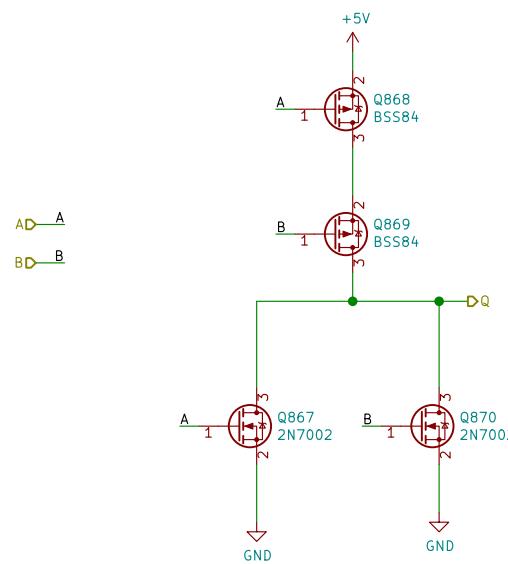
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E4/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 233/362

A

A

B

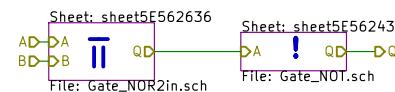
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E6/  
File: Gate\_OR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 234/362

A

B

C

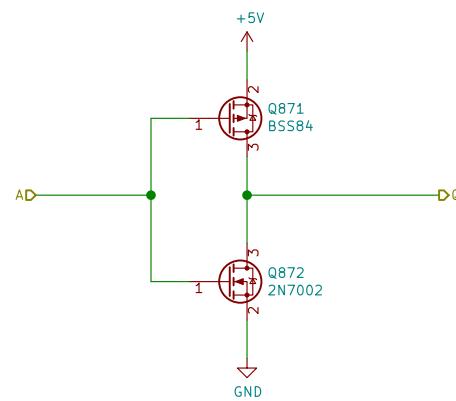
D

A

B

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E6/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 235/362

A

A

B

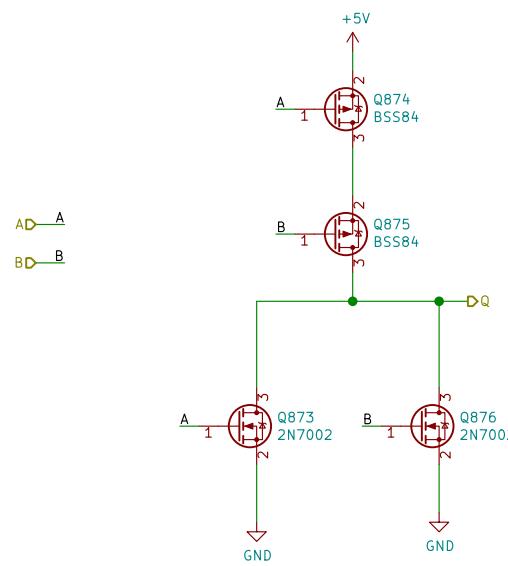
B

C

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D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAD6E6/sheet5E562636/

File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 236/362

A

A

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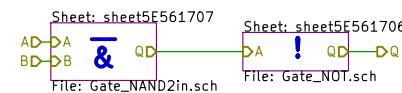
B

C

C

D

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDF7332/

File: Gate\_AND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 237/362

A

B

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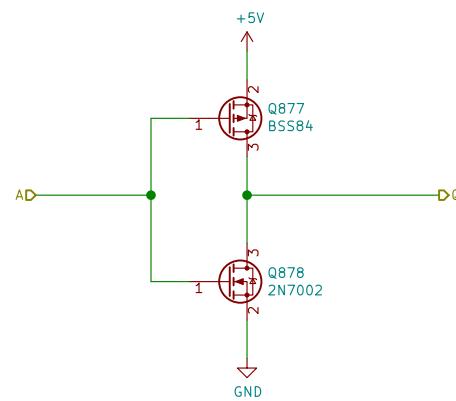
D

A

B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDF7332/sheet5E561706/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

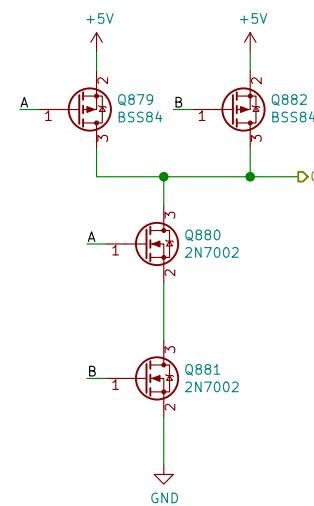
Id: 238/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDF7332/sheet5E561707/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 239/362

A

A

B

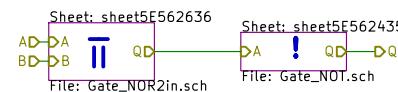
B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAA563/  
File: Gate\_OR2in.sch**Title: Fets and Crosses**Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3Rev: v0.2  
Id: 240/362

A

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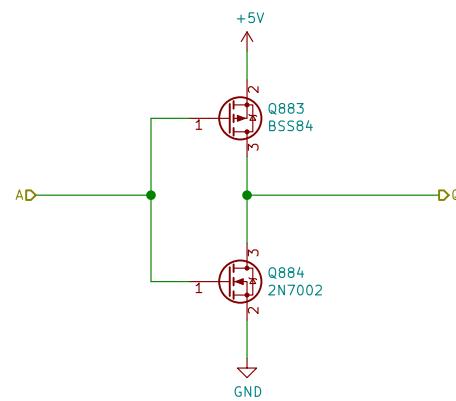
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAA563/sheet5E562435/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 241/362

A

A

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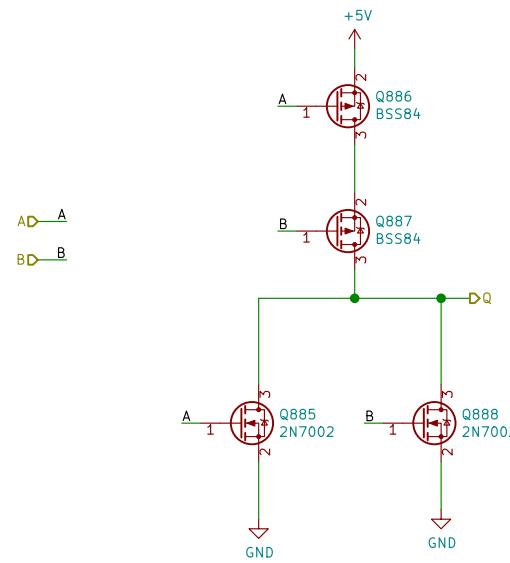
B

C

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EDAA563/sheet5E562636/  
File: Gate\_NOR2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 242/362

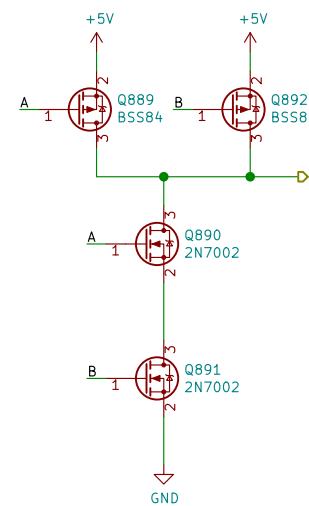
A

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AD—A  
BD—B



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE64E27/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

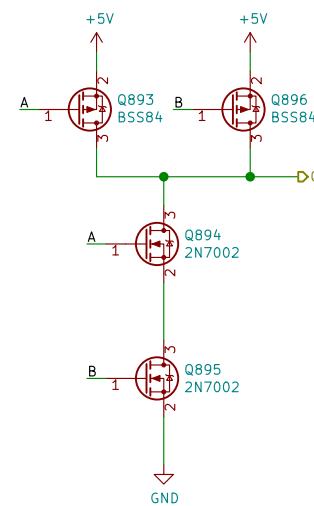
Id: 243/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE66B96/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

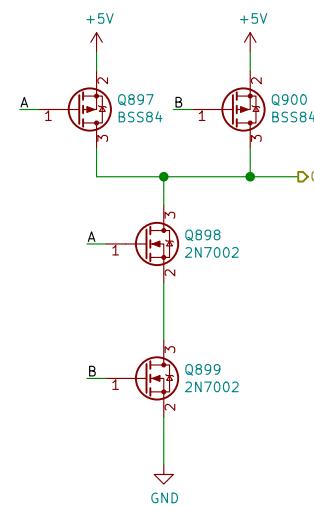
Id: 244/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE688E5/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

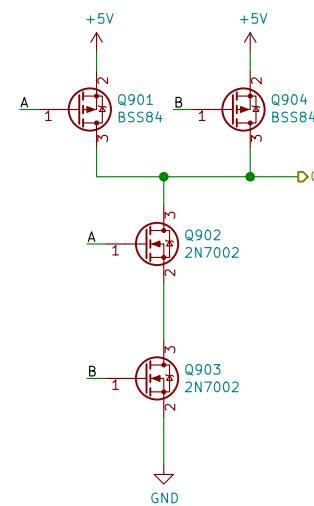
Id: 245/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE6A5D0/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

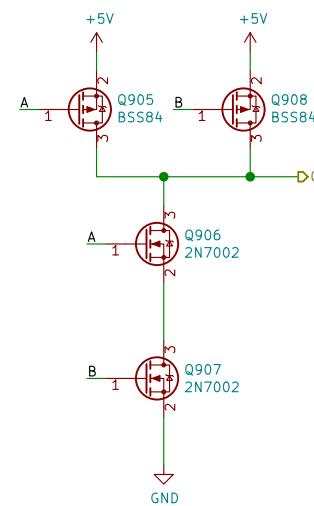
Id: 246/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE6C356/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
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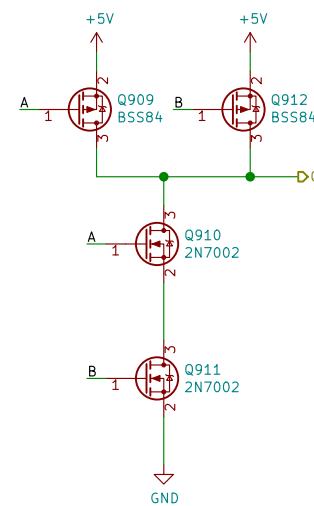
Rev: v0.2
Id: 247/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE6E0A5/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

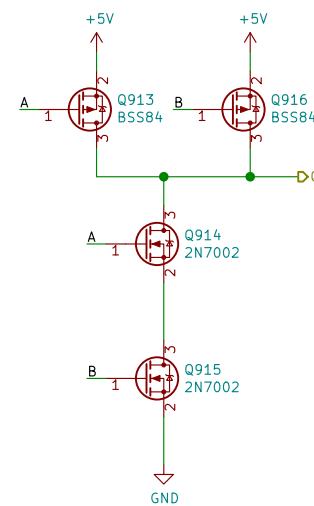
Rev: v0.2
Id: 248/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE6FDDE/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

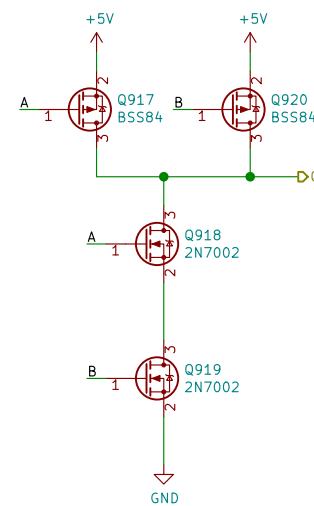
Rev: v0.2
Id: 249/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE71B39/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 250/362

A

A

B

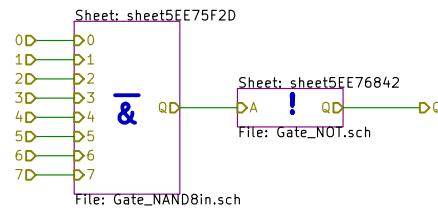
B

C

C

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D



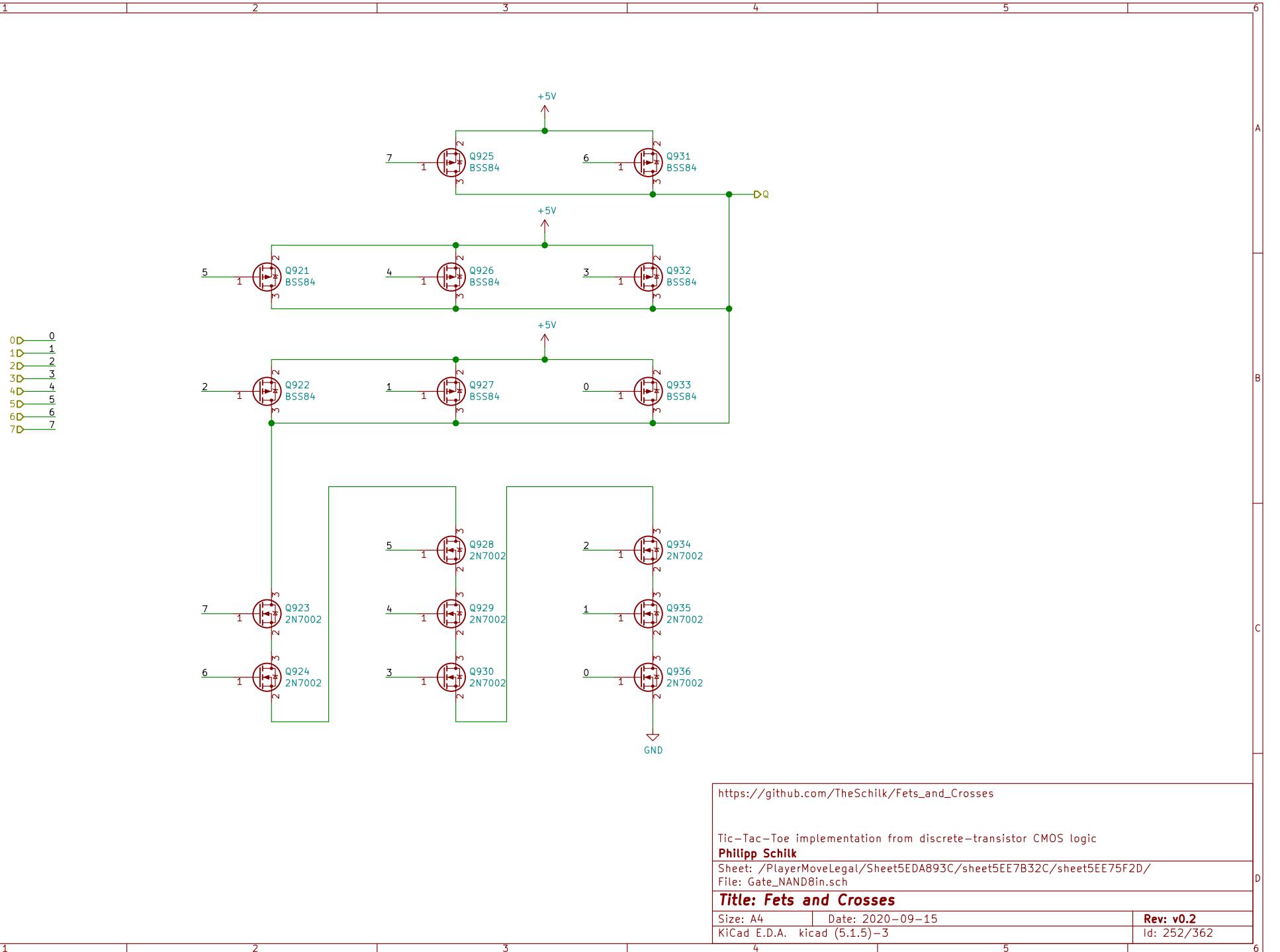
[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE7B32C/  
File: Gate\_AND8in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15	Rev: v0.2
KiCad E.D.A. kicad (5.1.5)-3		Id: 251/362



A

B

C

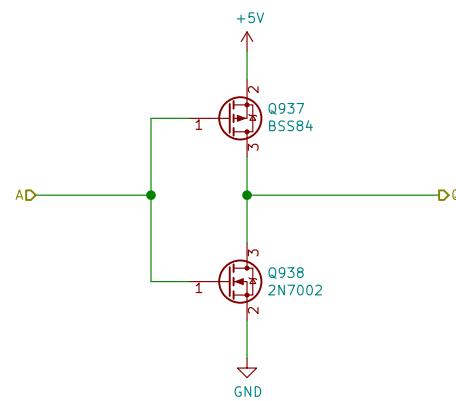
D

A

B

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMoveLegal/Sheet5EDA893C/sheet5EE7B32C/sheet5EE76842/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

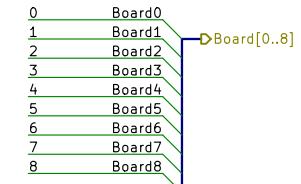
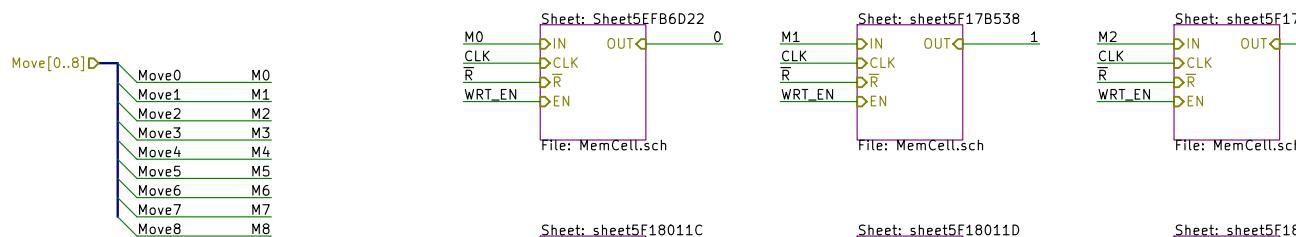
KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

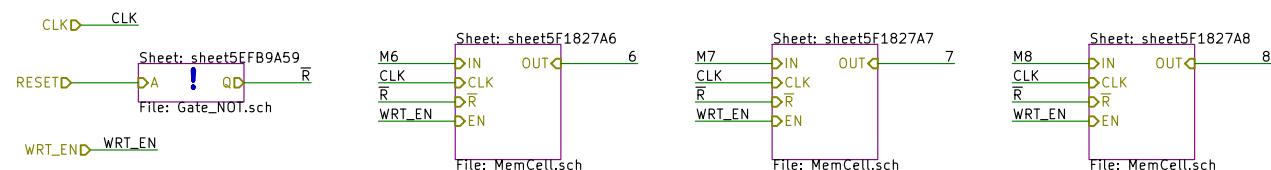
Id: 253/362

1 2 3 4 5 6

A

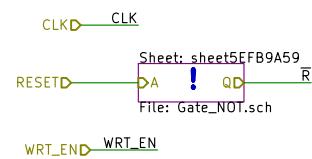


B



C

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/

File: PlayerMem.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 254/362

1 2 3 4 5 6

A

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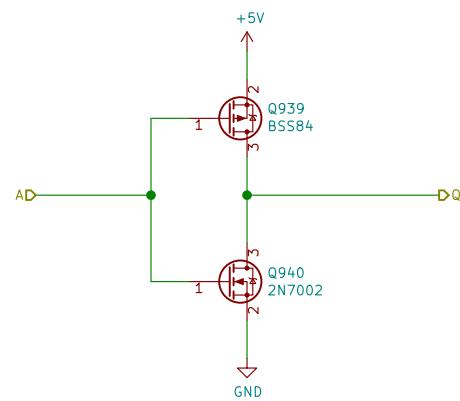
D

A

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5EFB9A59/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

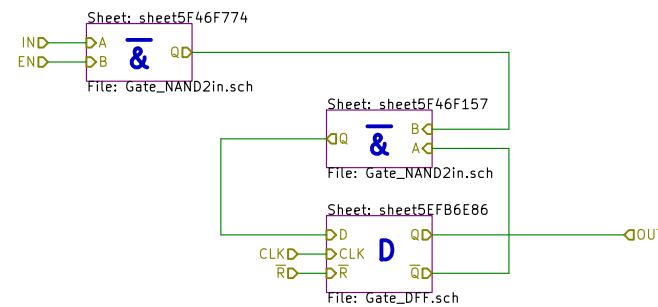
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 255/362

A



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A

B

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

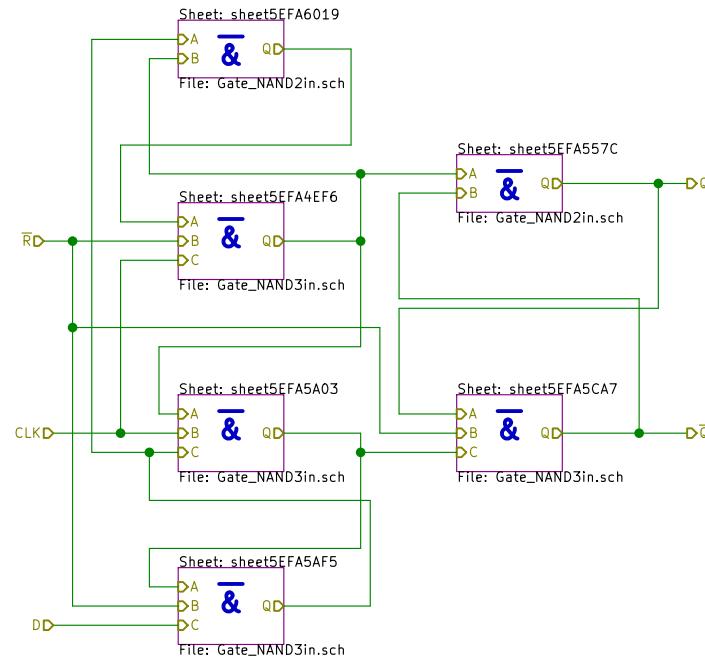
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File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

Id: 256/362
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

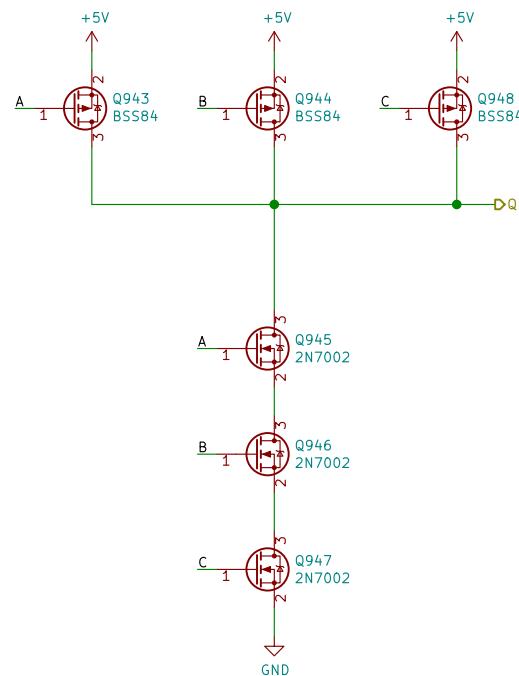
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File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 257/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

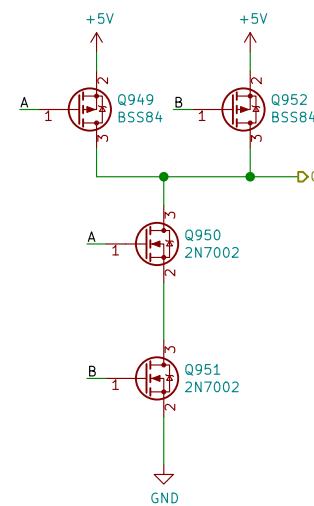
Id: 258/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**Sheet: /PlayerMem\_2/Sheet5EFA557C/sheet5EFA557C/  
File: Gate\_NAND2in.sch**Title: Fets and Crosses**

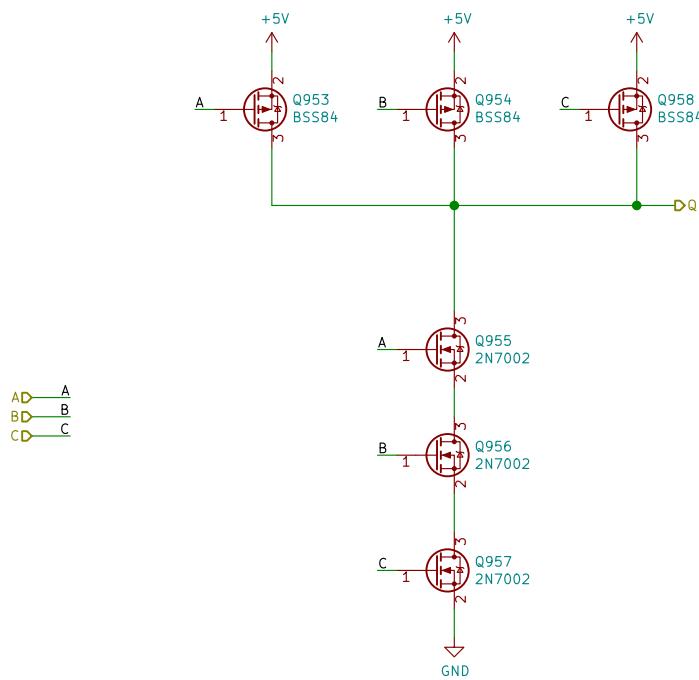
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 259/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

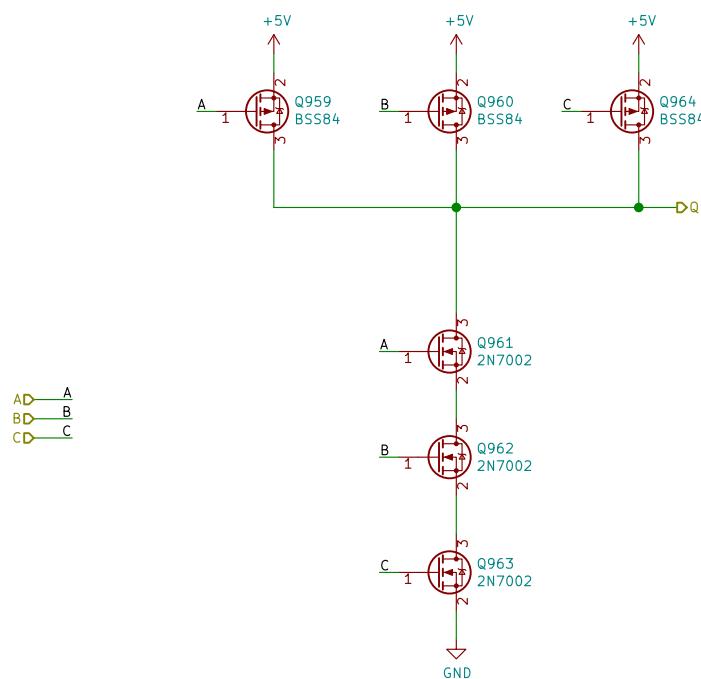
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 260/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 261/362

A

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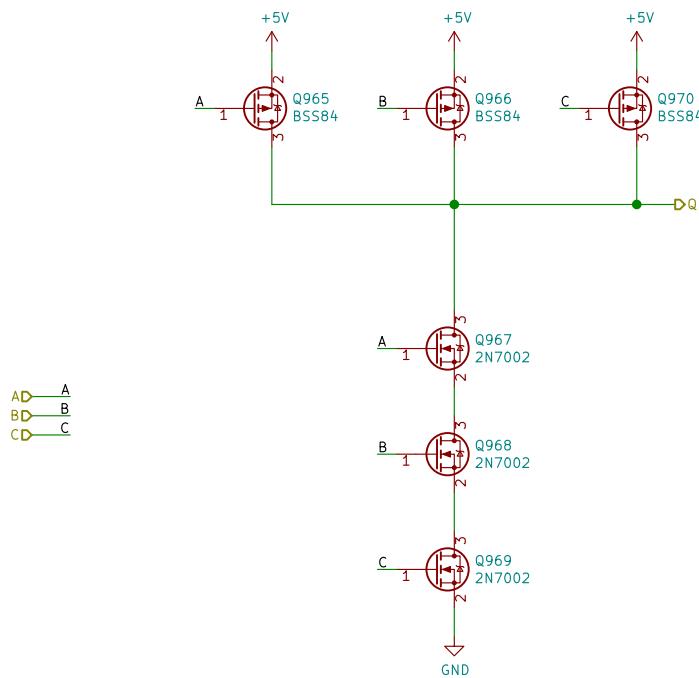
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5EFB6E86/sheet5EFA5CA7/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

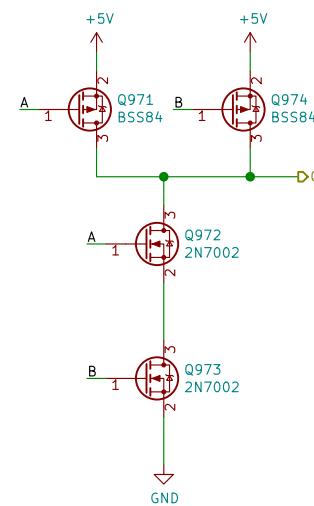
Id: 262/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/Sheet5EFA6D22/sheet5EFA6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

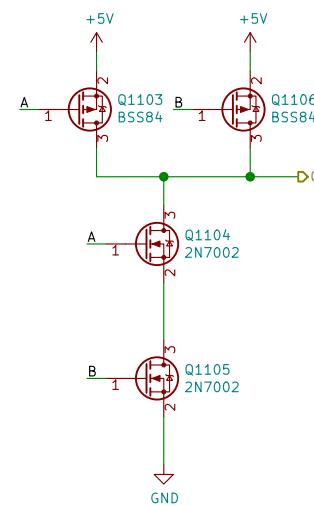
Id: 263/362

A

B

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

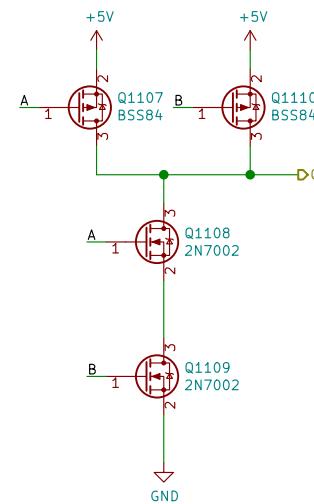
Id: 264/362

A

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/Sheet5EFB6D22/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

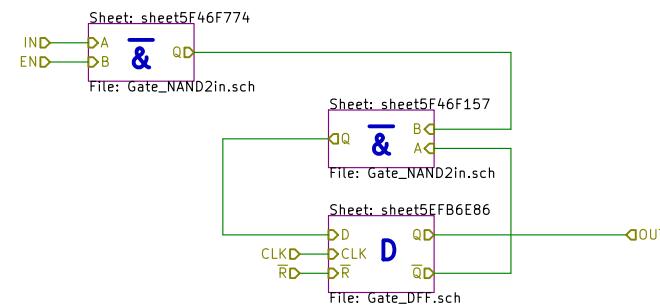
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 265/362

A



B

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D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

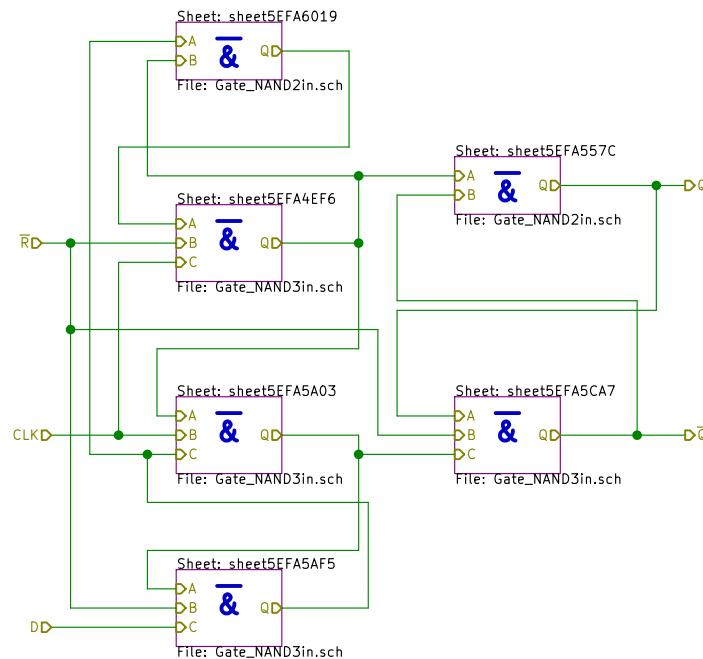
Sheet: /PlayerMem\_2/sheet5F17B538/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 266/362

A



B

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D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

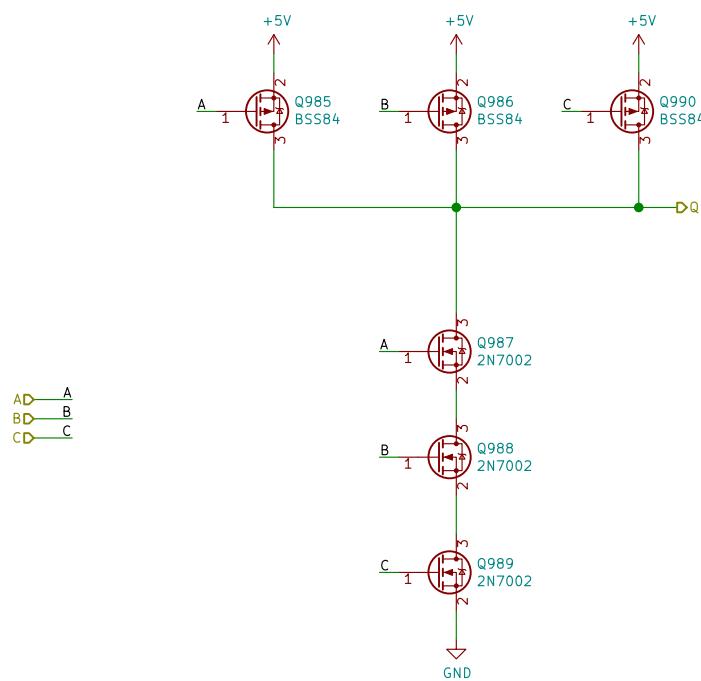
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 267/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

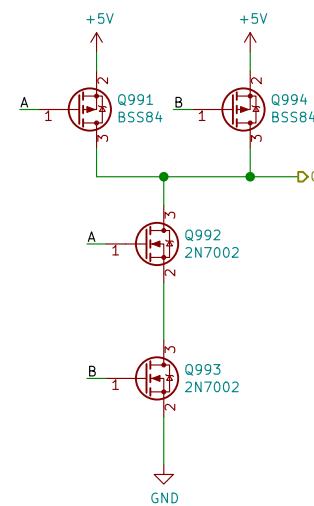
Id: 268/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 269/362

A

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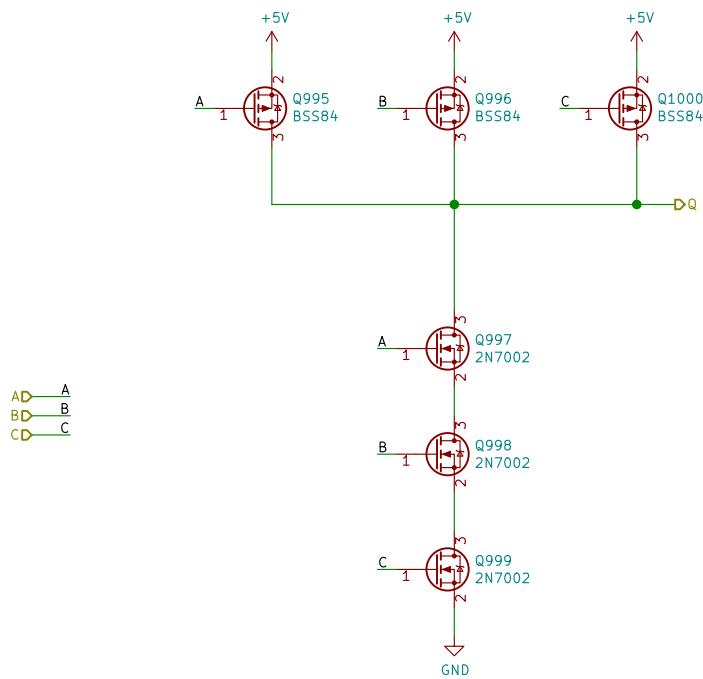
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 270/362

A

B

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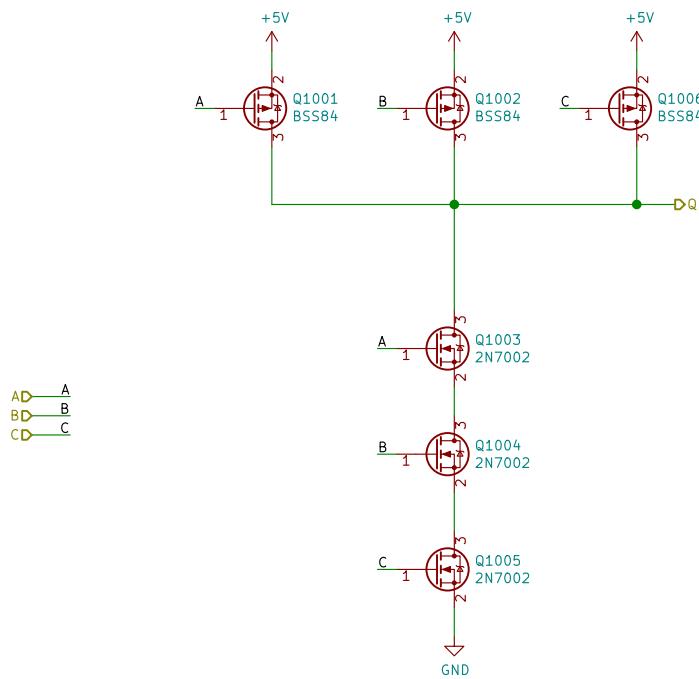
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 271/362

A

B

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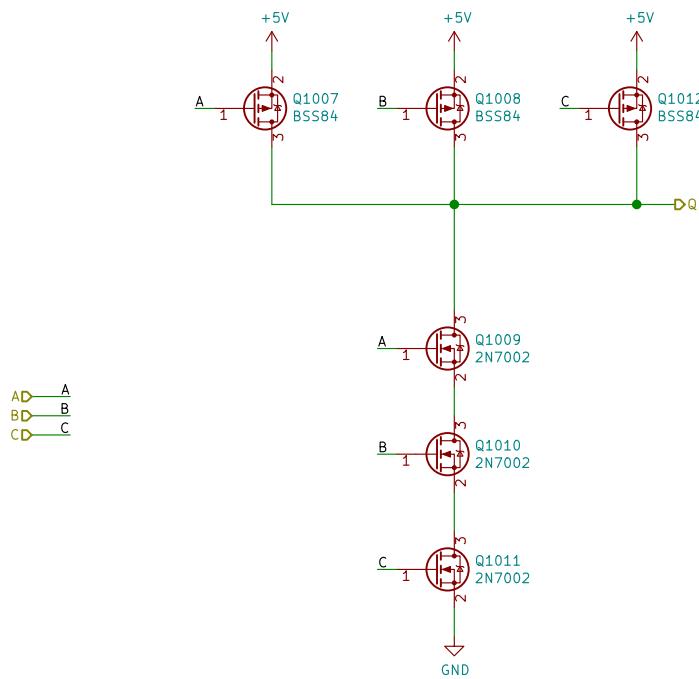
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

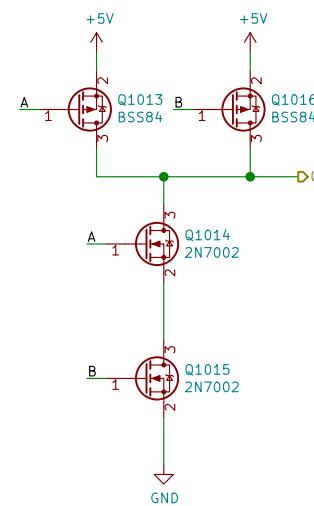
Id: 272/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5EFB6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

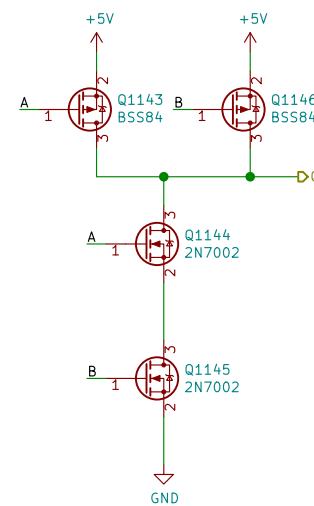
Id: 273/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_2/sheet5F17B538/sheet5F46F157/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

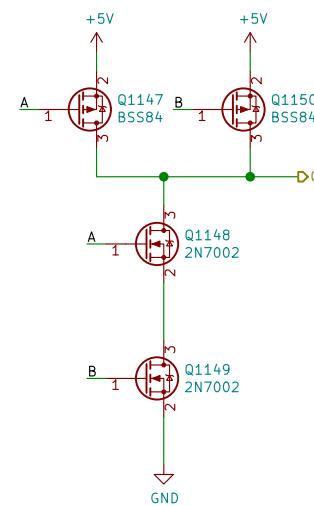
Id: 274/362
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A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17B538/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

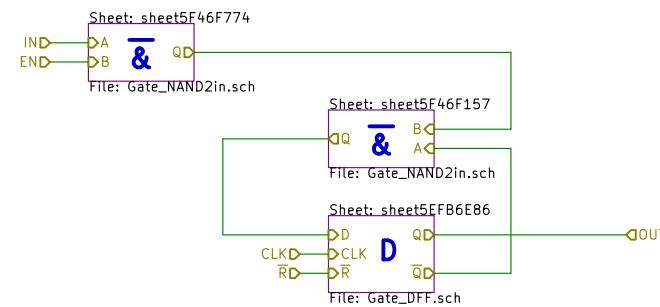
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 275/362

A



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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

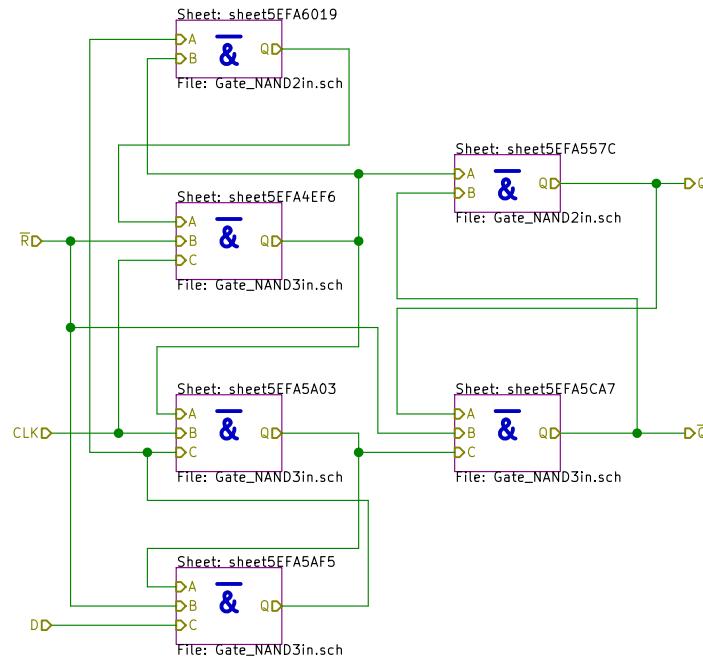
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_2/sheet5F17D798/  
 File: MemCell.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 276/362

A



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B

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D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

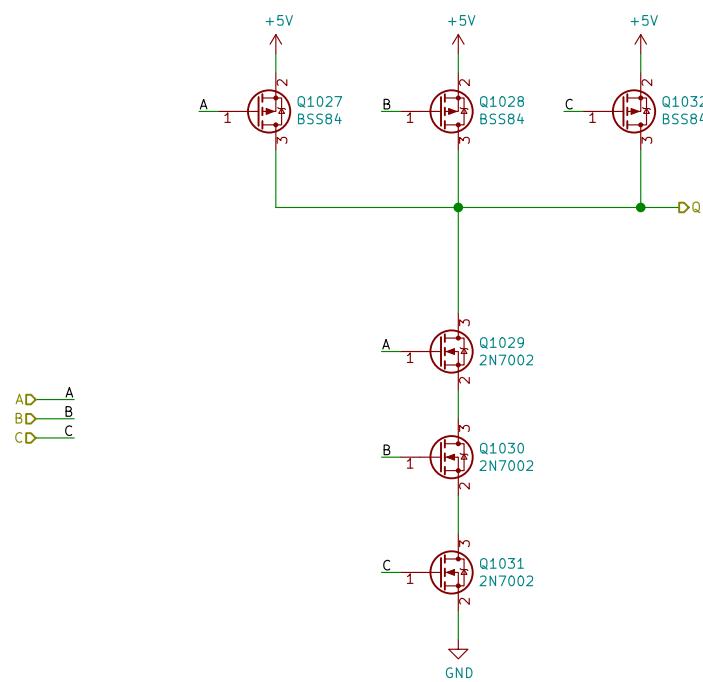
Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 277/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA4EF6/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

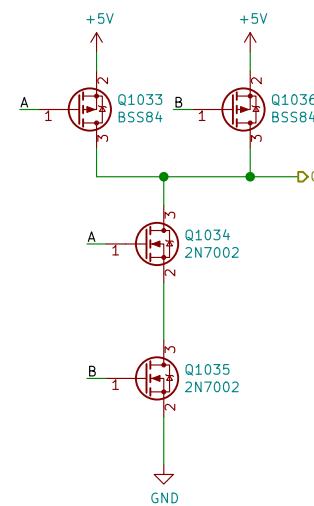
Rev: v0.2  
Id: 278/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 279/362

A

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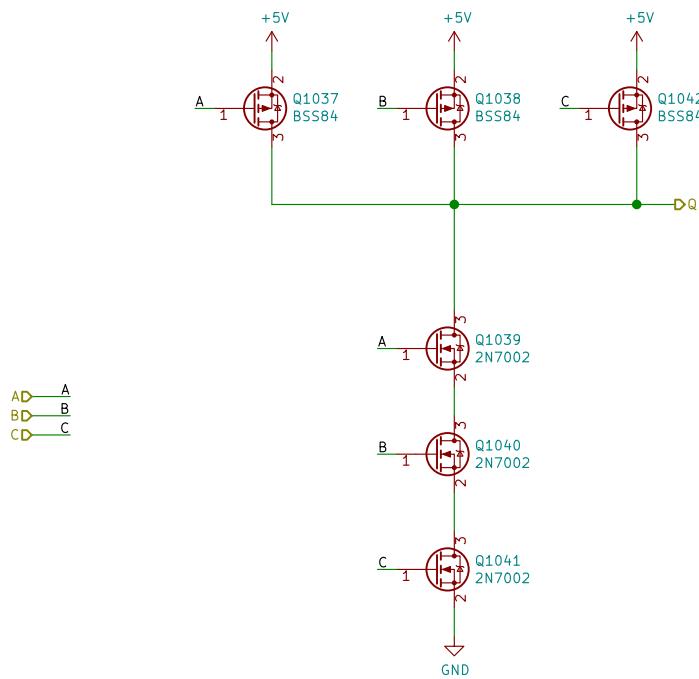
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 280/362

A

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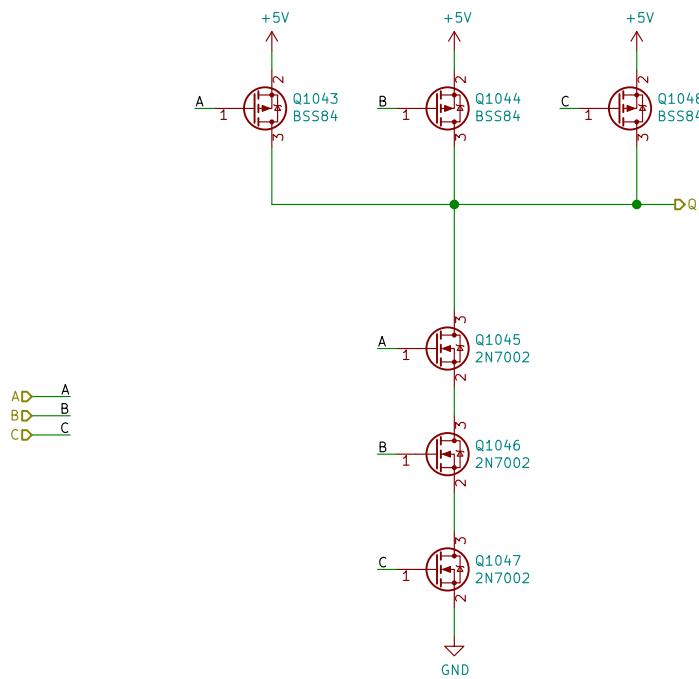
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 281/362

A

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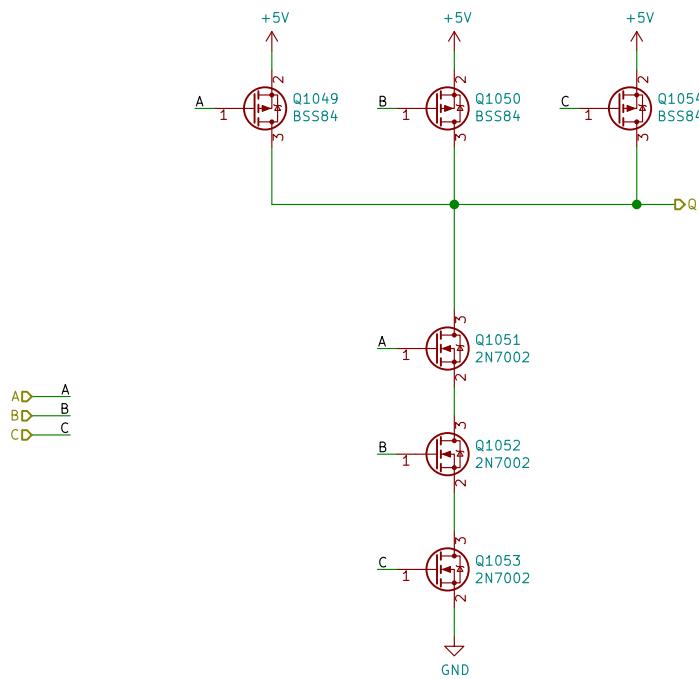
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

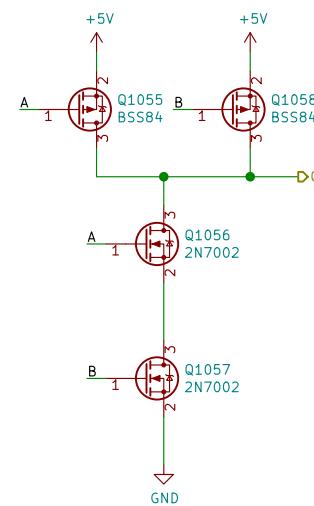
Id: 282/362

A

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C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5EFB6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

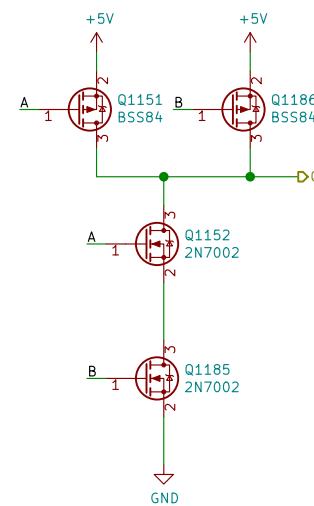
Id: 283/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMem\_2/sheet5F17D798/sheet5F46F157/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

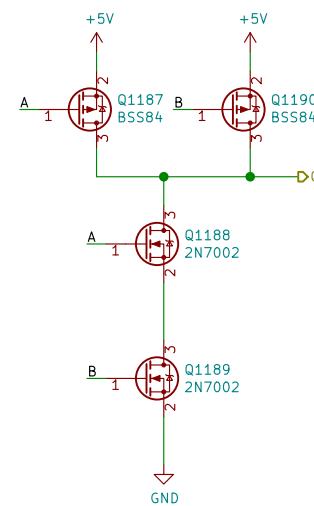
Rev: v0.2
Id: 284/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F17D798/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 285/362

A

B

C

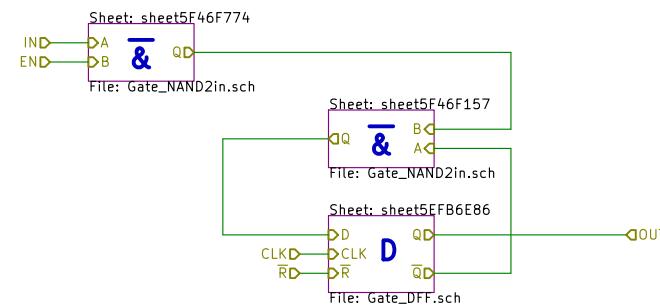
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

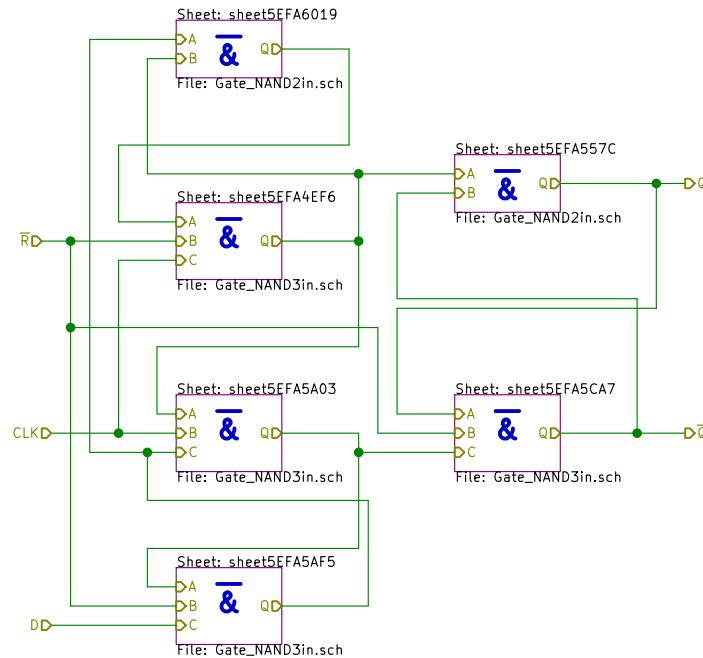
**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2
Id: 286/362	

A



B

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D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2  
Id: 287/362

A

B

C

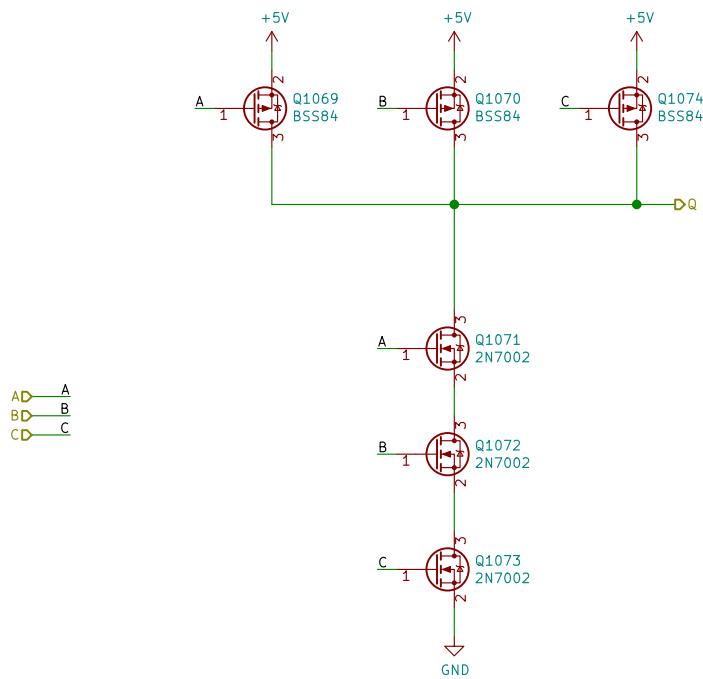
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

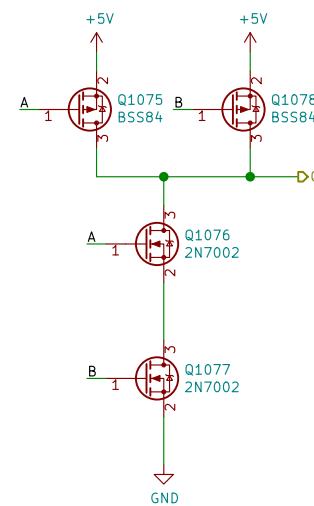
Id: 288/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5EFA557C/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 289/362

A

B

C

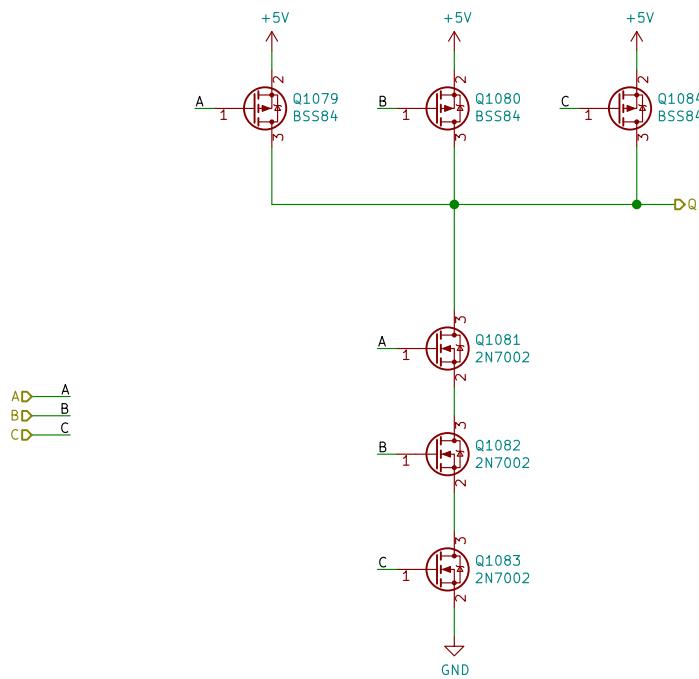
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5EFB6E86/sheet5EFA5A03/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 290/362

A

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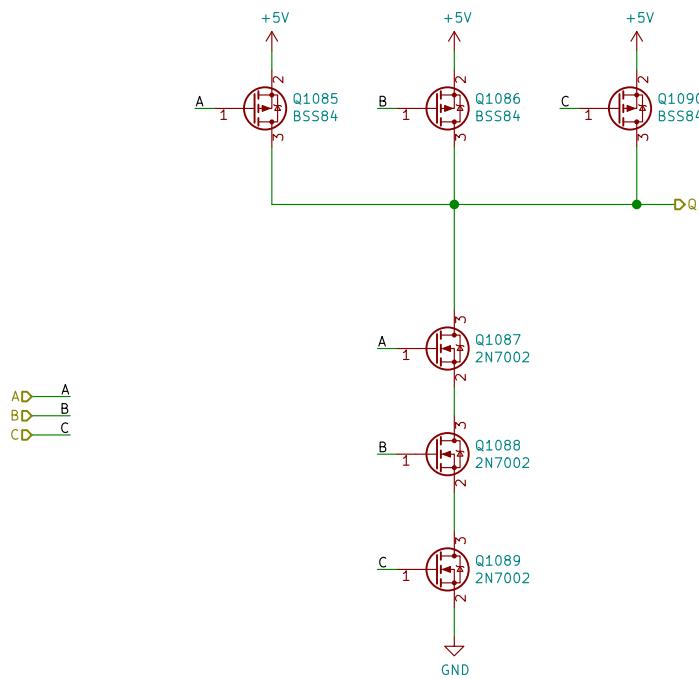
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5E8FB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 291/362

A

B

C

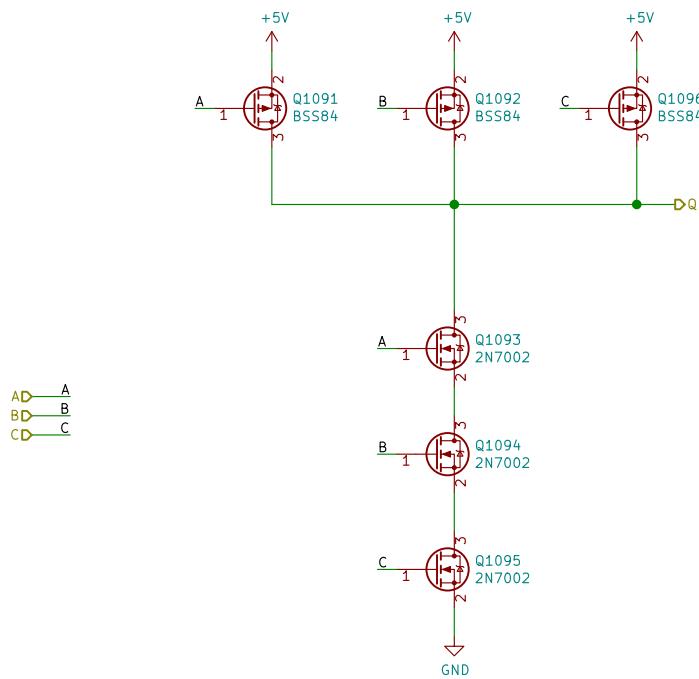
D

A

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

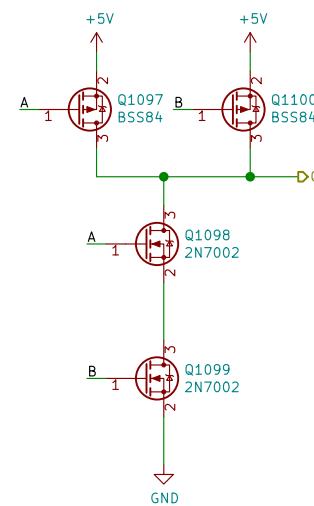
Id: 292/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5E86E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

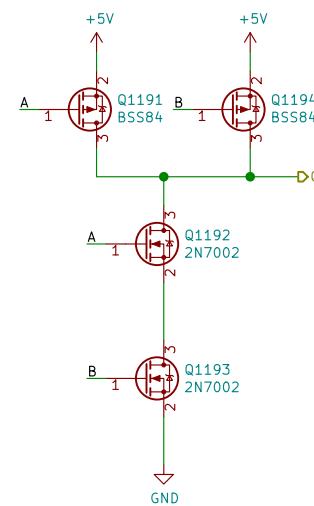
Id: 293/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

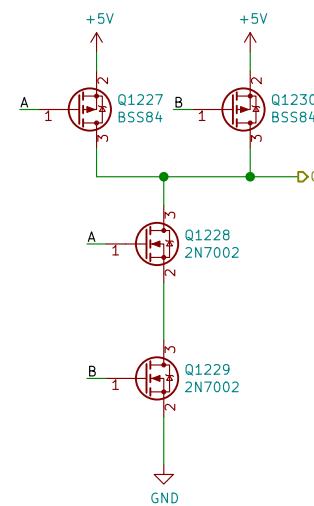
Id: 294/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011C/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

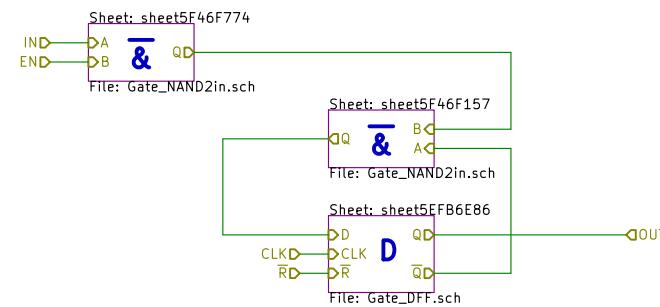
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 295/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

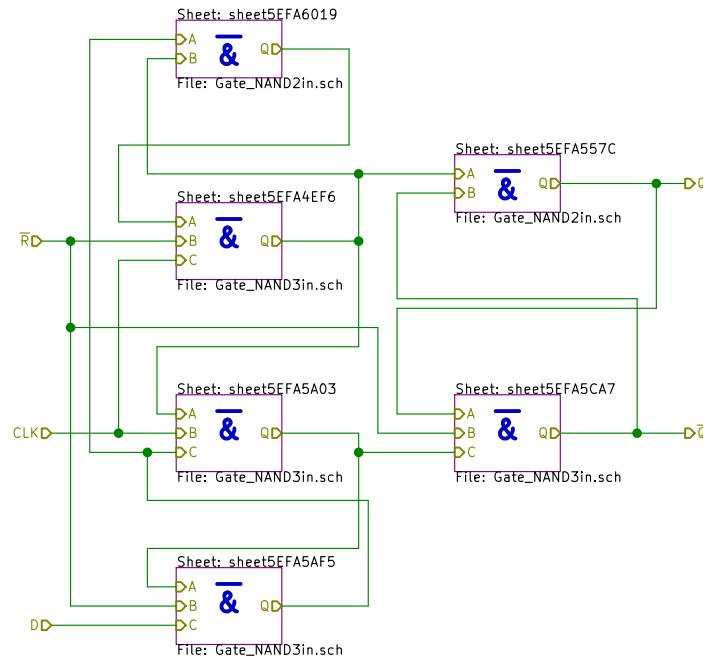
Sheet: /PlayerMem\_2/sheet5F18011D/  
File: MemCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

Id: 296/362
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A



B

C

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A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 297/362

A

B

C

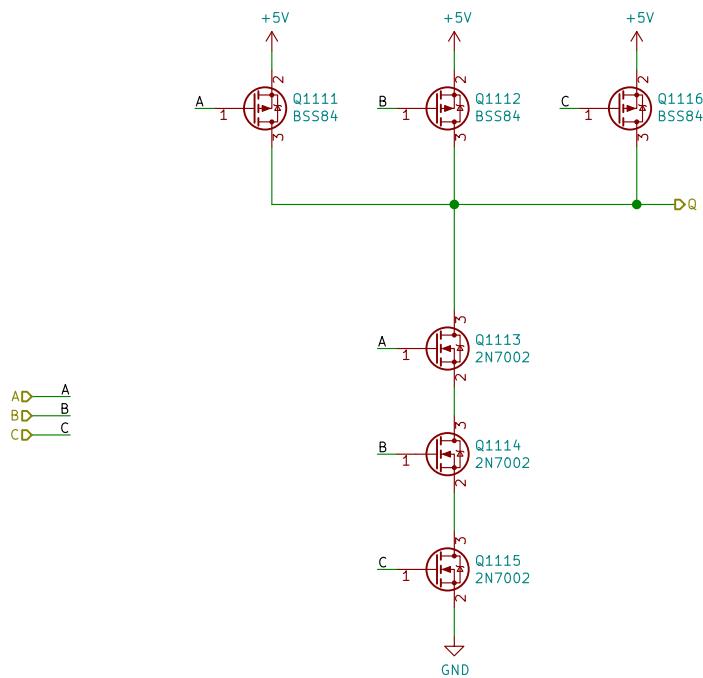
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5EFB6E86/sheet5EFA4EF6/  
File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15  
KiCad E.D.A. kicad (5.1.5)-3

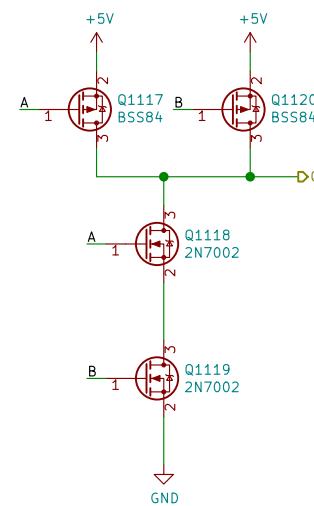
Rev: v0.2  
Id: 298/362

A

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5E86E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 299/362

A

B

C

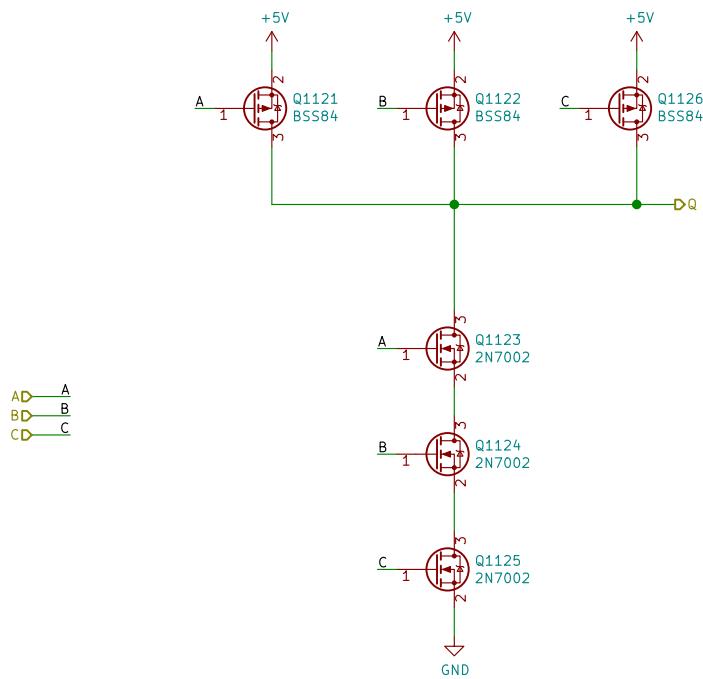
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 300/362

A

B

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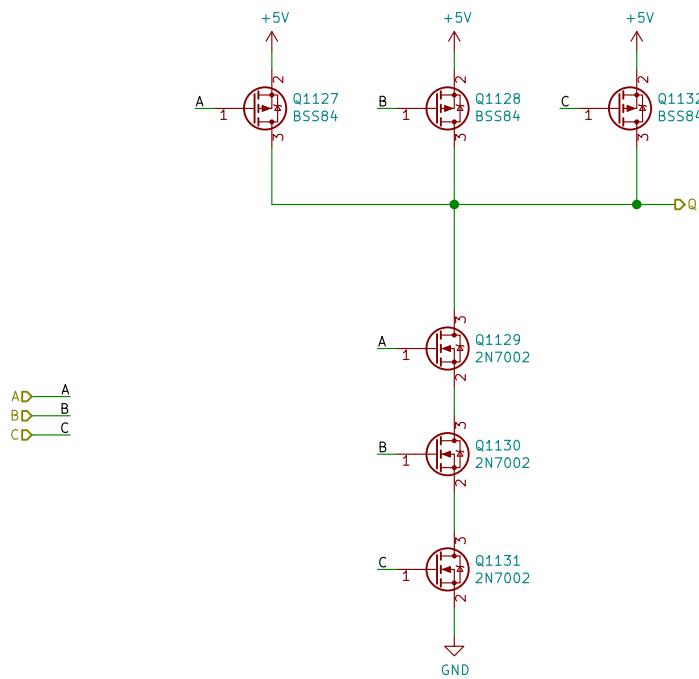
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 301/362

A

A

B

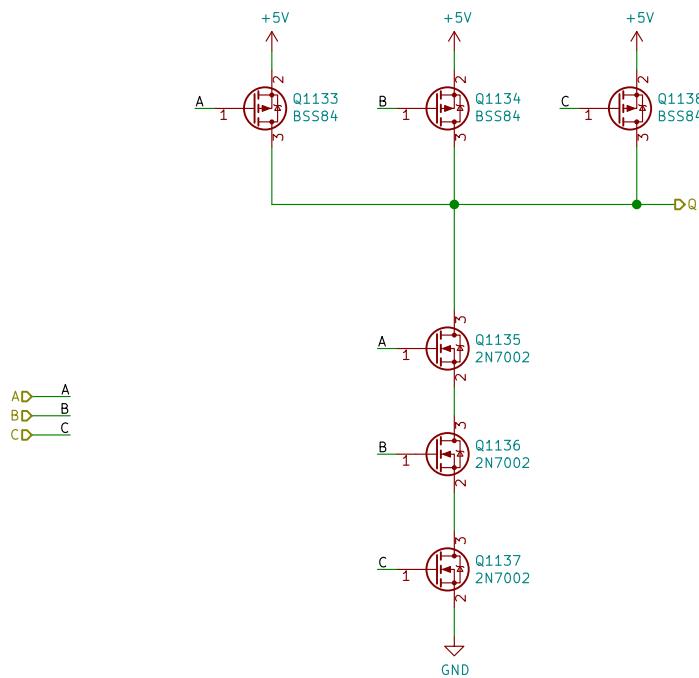
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5EFB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

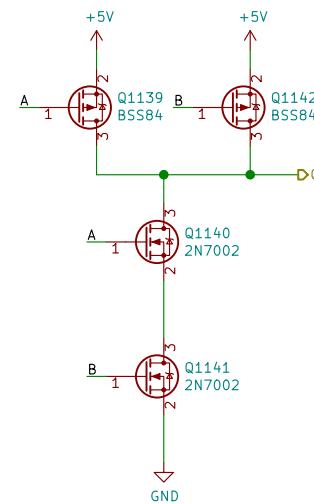
Id: 302/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5E86E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

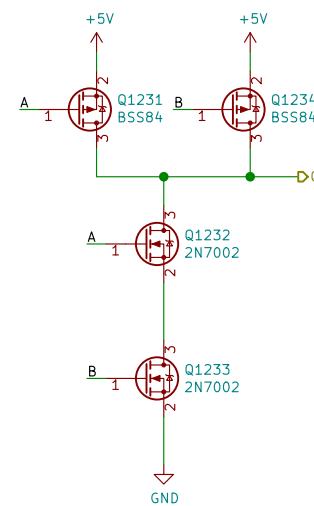
Id: 303/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

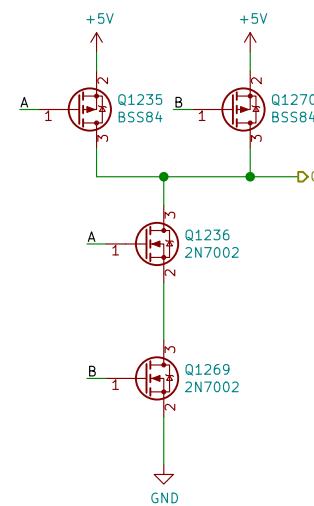
Id: 304/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011D/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 305/362

A

A

B

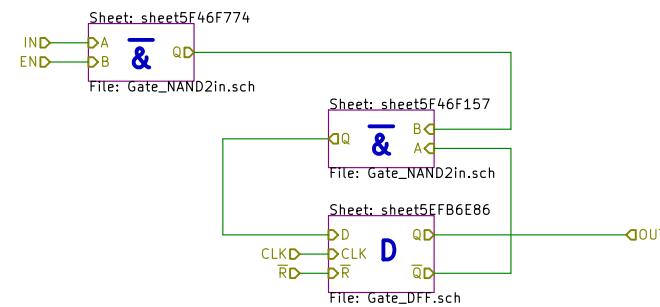
B

C

C

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/

File: MemCell.sch

**Title: Fets and Crosses**

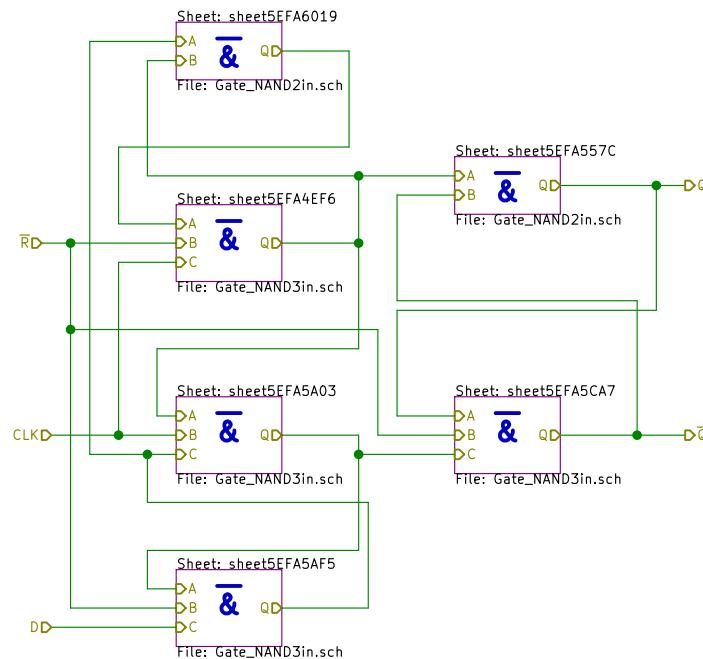
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 306/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5EFB6E86/

File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 307/362

A

B

C

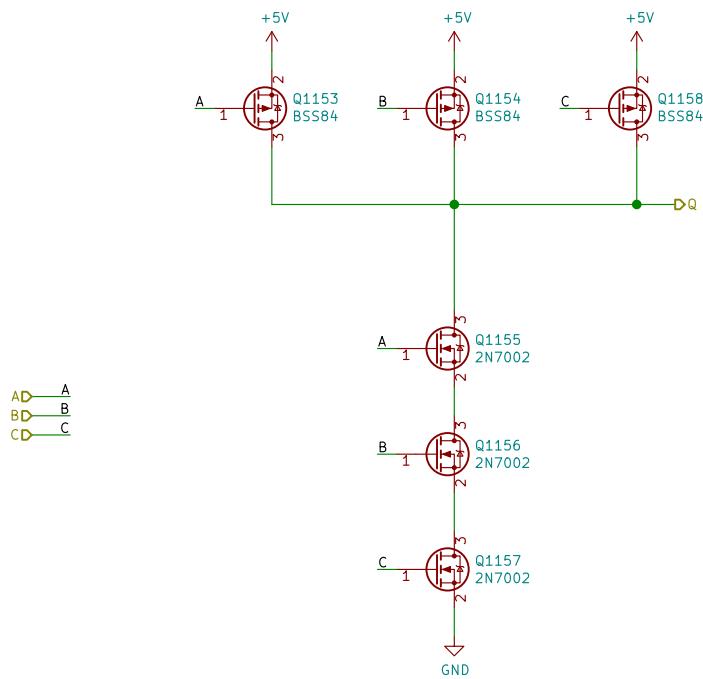
D

A

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

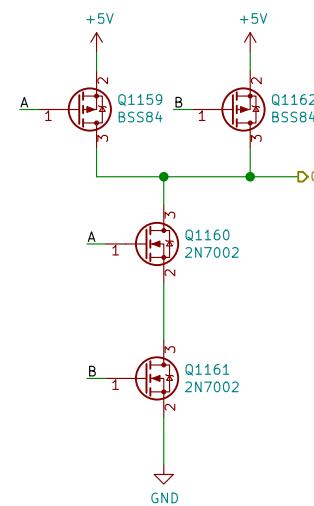
Id: 308/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5E86E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 309/362

A

B

C

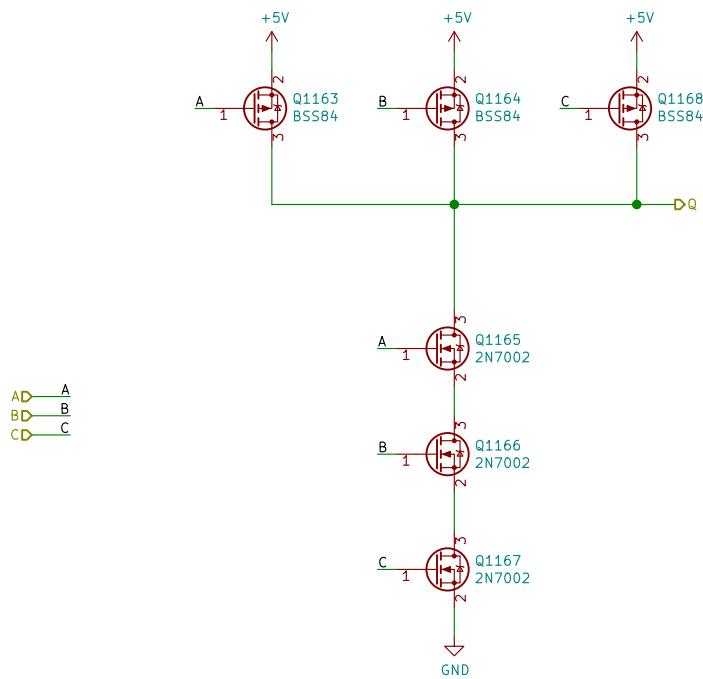
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5E8FB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 310/362

A

B

C

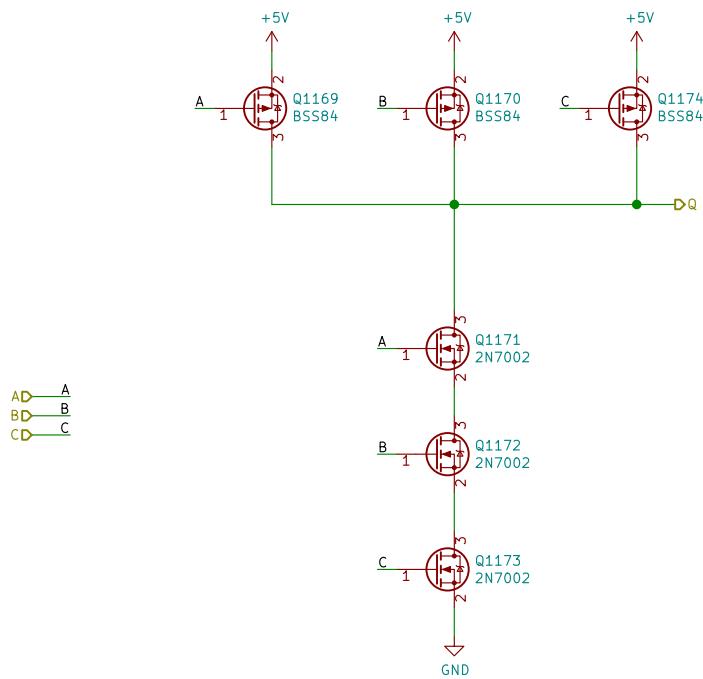
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 311/362

A

B

C

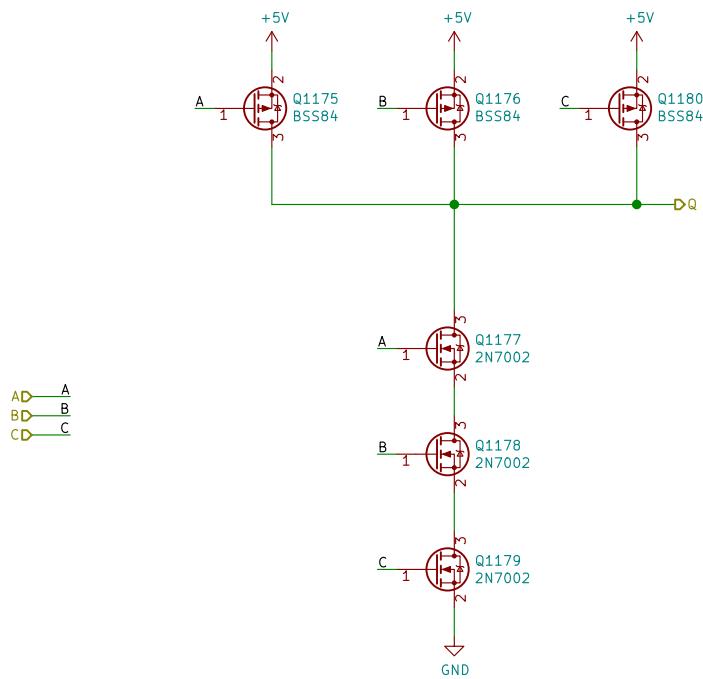
D

A

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C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5E8FB6E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

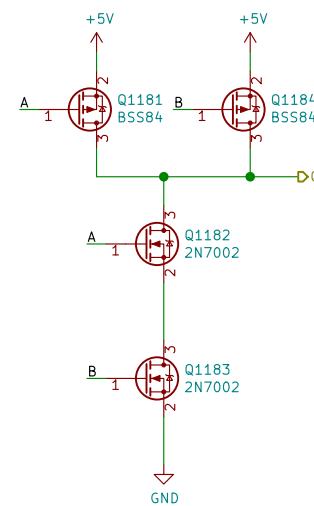
Id: 312/362

A

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5EFB6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

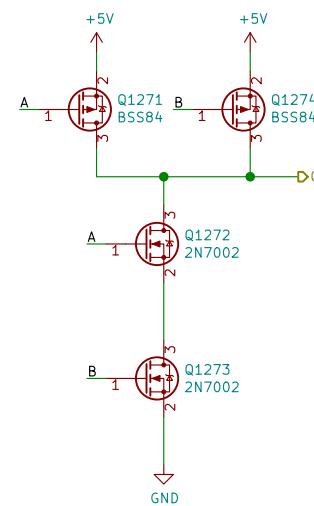
Id: 313/362

A

B

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

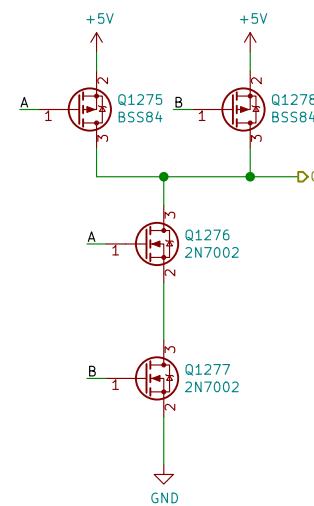
Id: 314/362

A

B

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F18011E/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 315/362

A

A

B

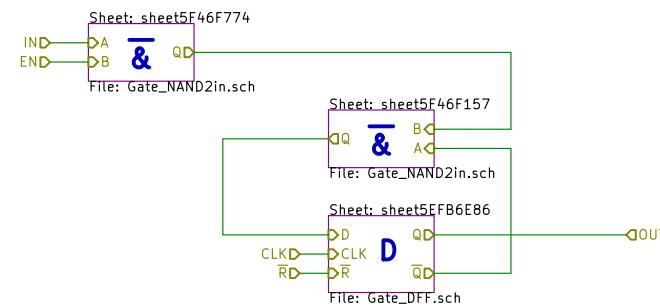
B

C

C

D

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A6/

File: MemCell.sch

**Title: Fets and Crosses**

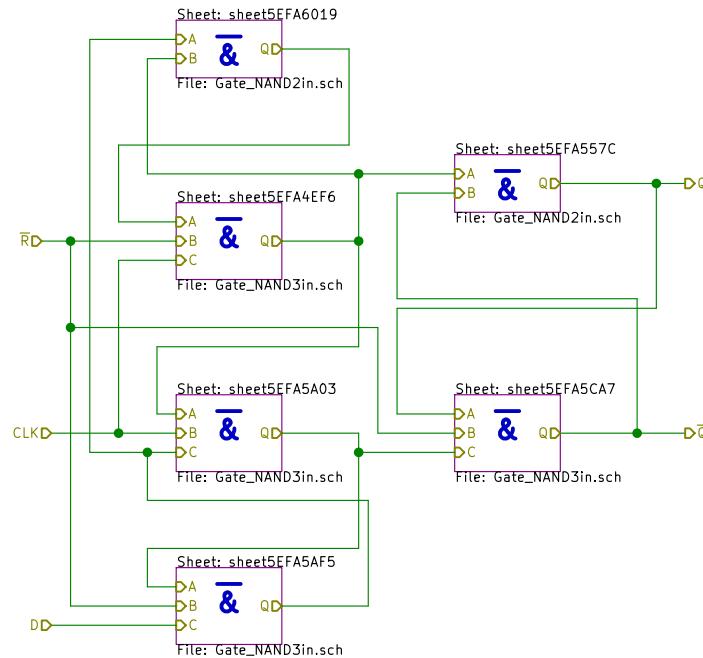
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 316/362

A



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 317/362

A

B

C

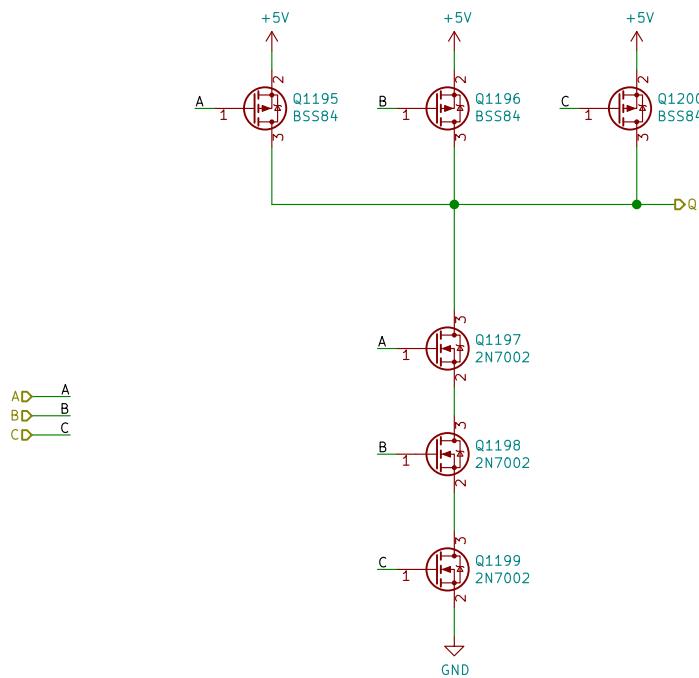
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5E86E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

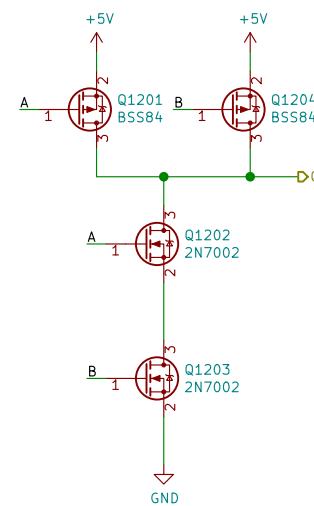
Id: 318/362

A

B

C

D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5E86E86/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 319/362

A

B

C

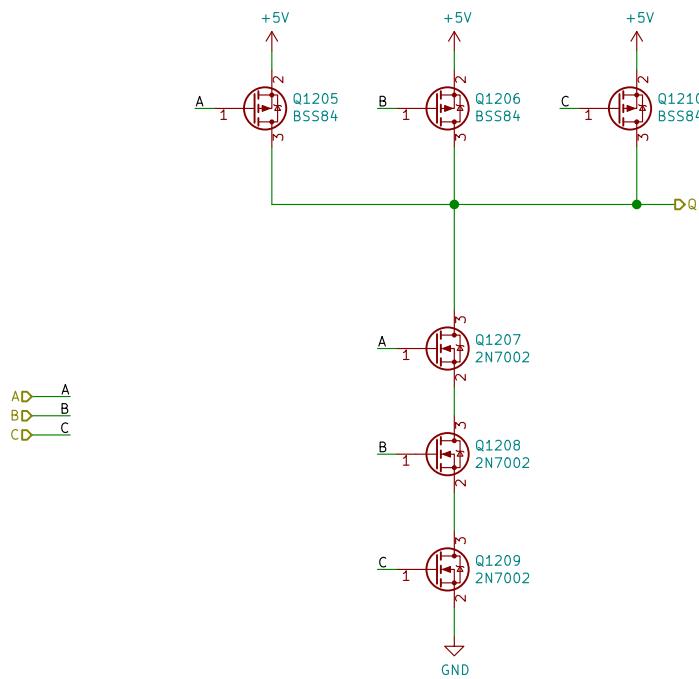
D

A

B

C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5E86E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 320/362

A

B

C

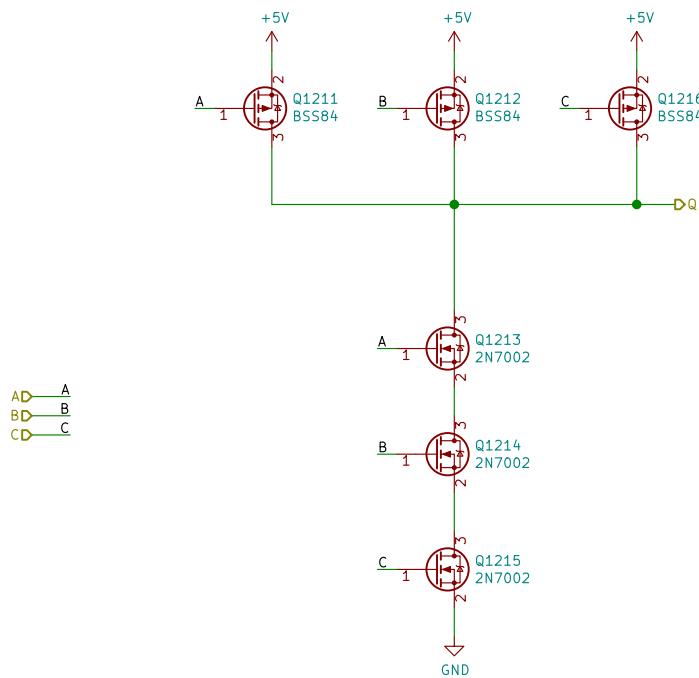
D

A

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C

D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 321/362

A

B

C

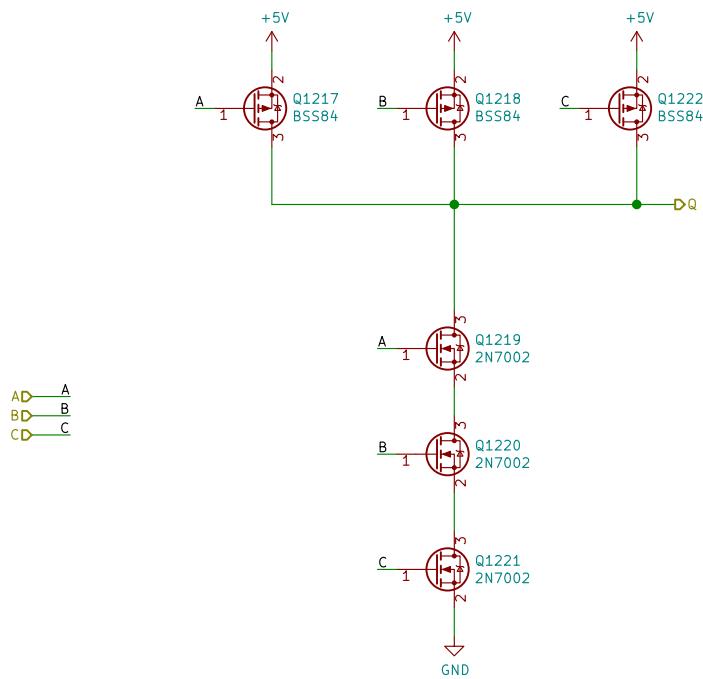
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

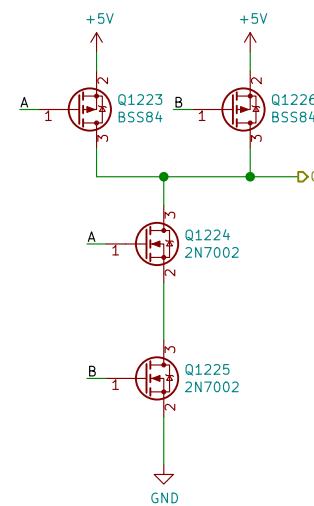
Id: 322/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5EFA6E86/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

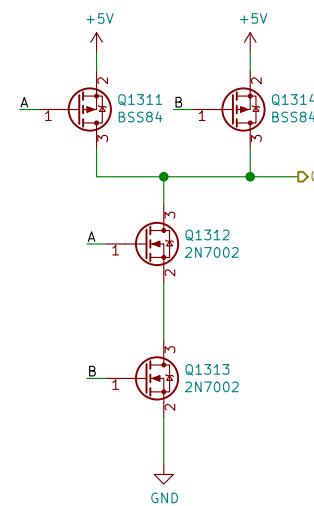
Id: 323/362

A

B

C

D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5F46F157/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

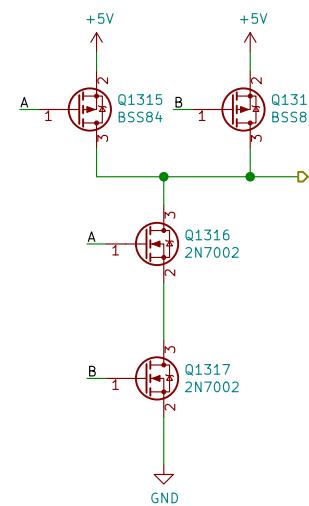
Rev: v0.2
Id: 324/362

A

B

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

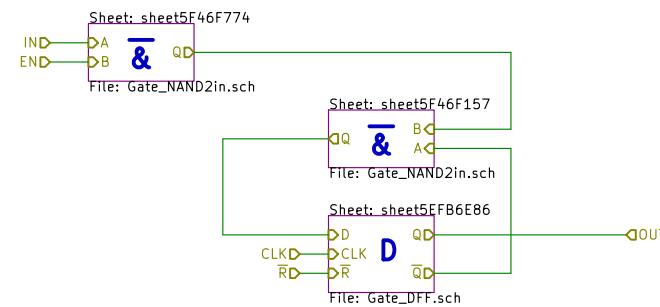
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
Sheet: /PlayerMem\_2/sheet5F1827A6/sheet5F46F774/  
File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2
Id: 325/362

A



B

C

D

A

B

C

D

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A7/

File: MemCell.sch

**Title: Fets and Crosses**

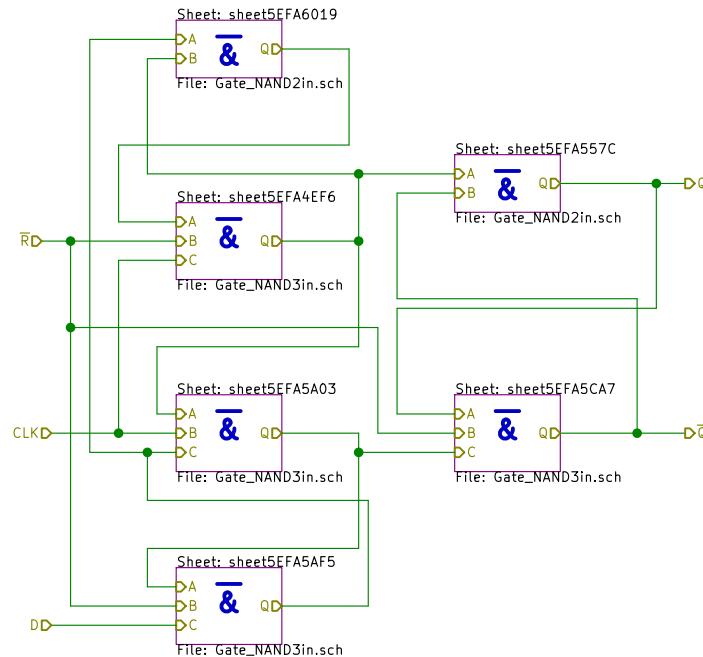
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 326/362

A



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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 327/362

A

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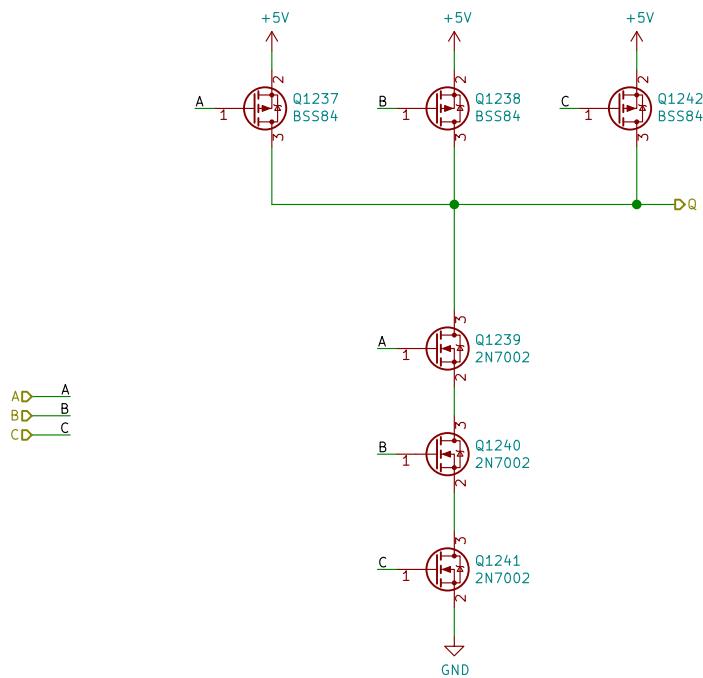
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFB6E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

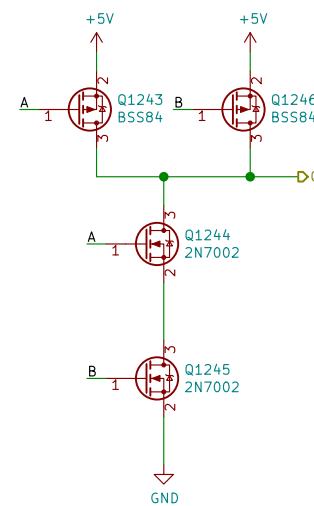
Id: 328/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFA557C/sheet5EFA557C/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 329/362

A

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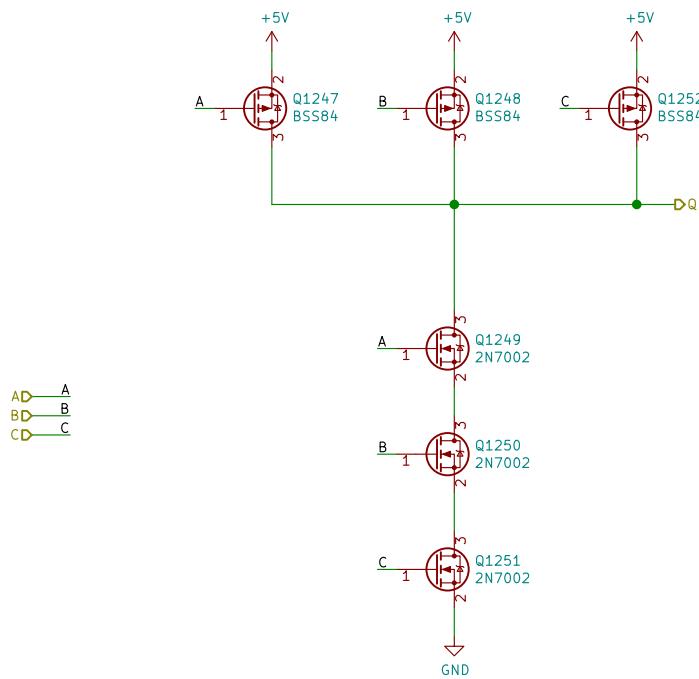
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 330/362

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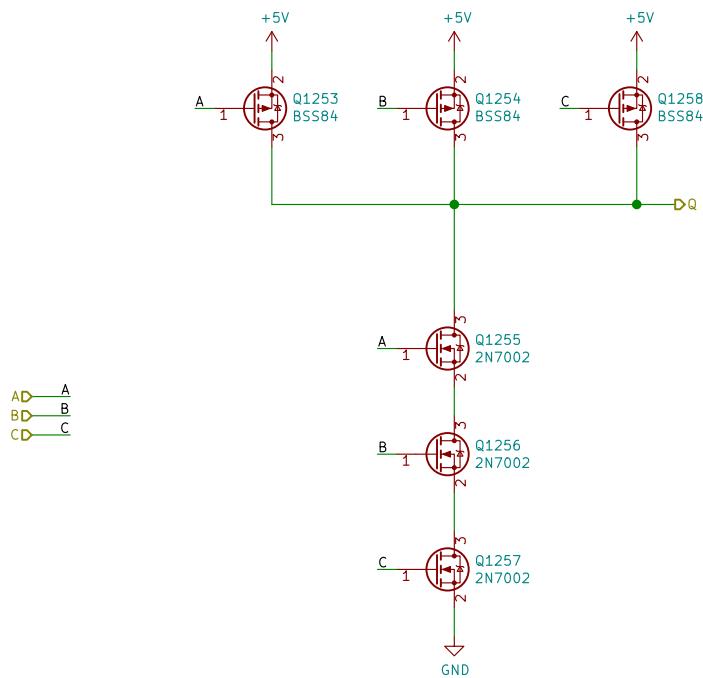
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFB6E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

Id: 331/362

A

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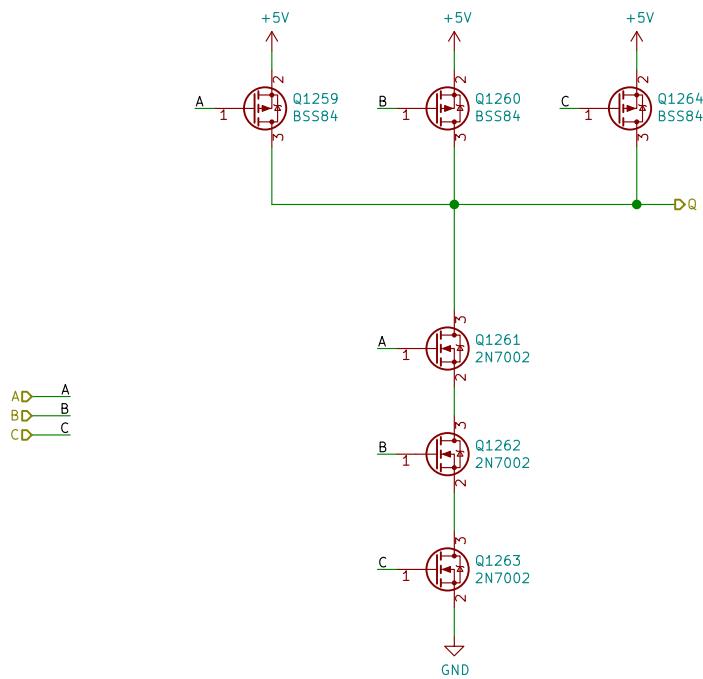
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

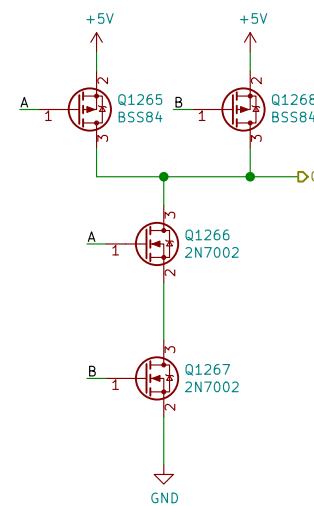
Id: 332/362

A

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AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5EFA6019/sheet5EFA6019/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

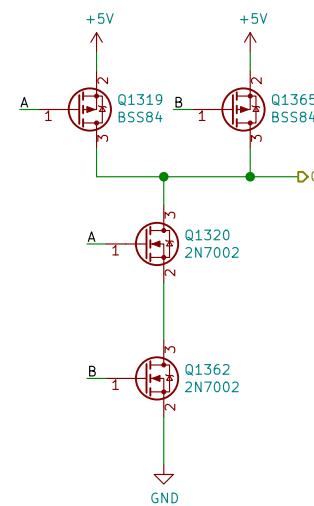
Id: 333/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

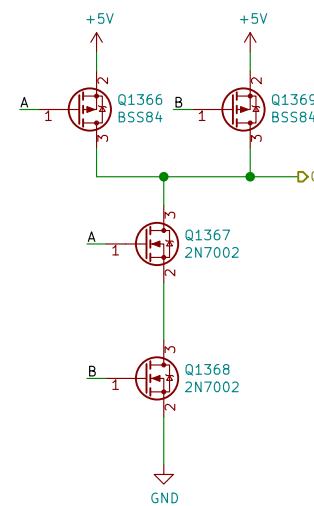
Id: 334/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_2/sheet5F1827A7/sheet5F46F774/  
 File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

Id: 335/362
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A

A

B

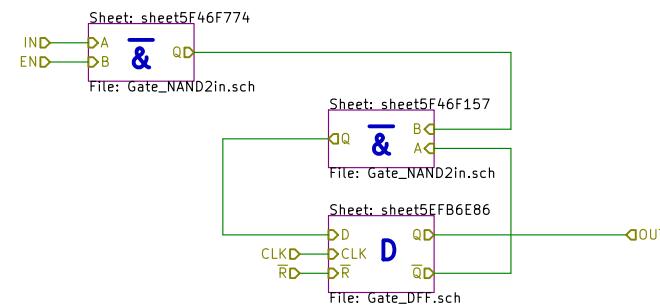
B

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D



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A8/

File: MemCell.sch

**Title: Fets and Crosses**

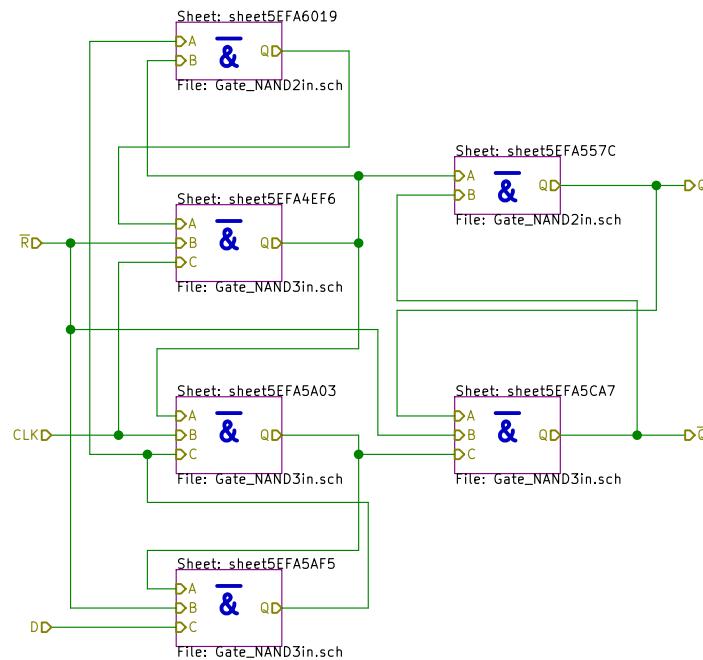
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 336/362

A



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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5EFB6E86/  
File: Gate\_DFF.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 337/362

A

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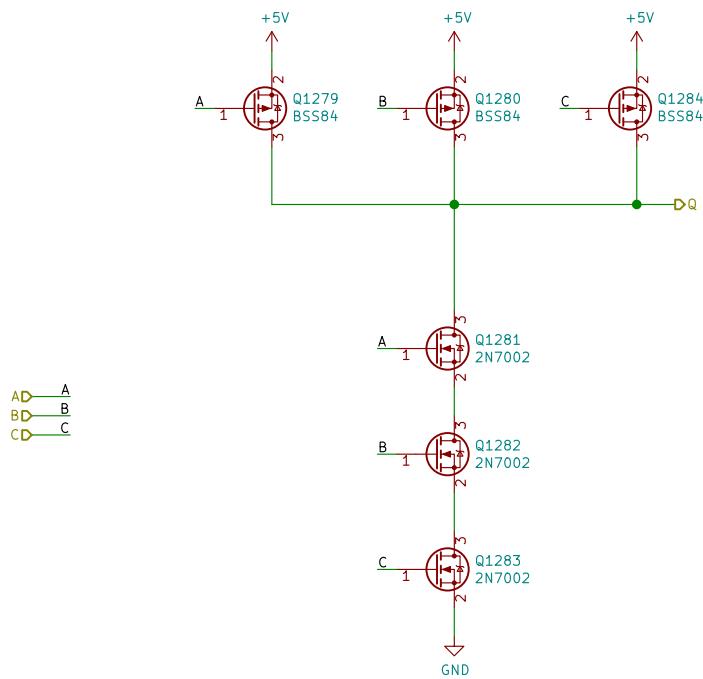
D

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5E86E86/sheet5EFA4EF6/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

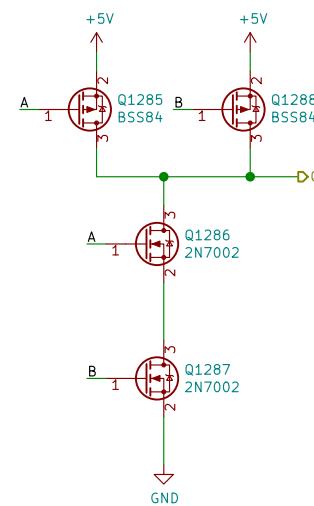
Id: 338/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5E86E86/sheet5EFA557C/  
 File: Gate\_NAND2in.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 339/362

A

B

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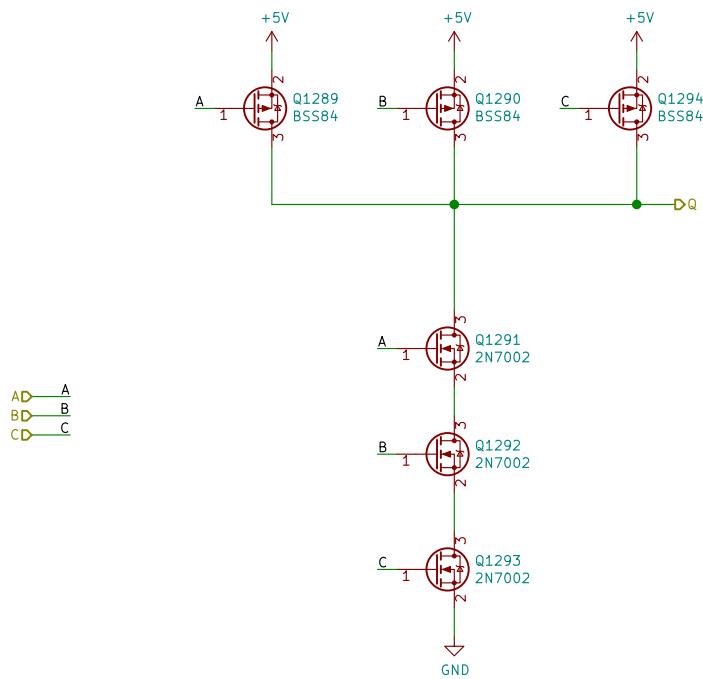
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5EFB6E86/sheet5EFA5A03/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 340/362

A

B

C

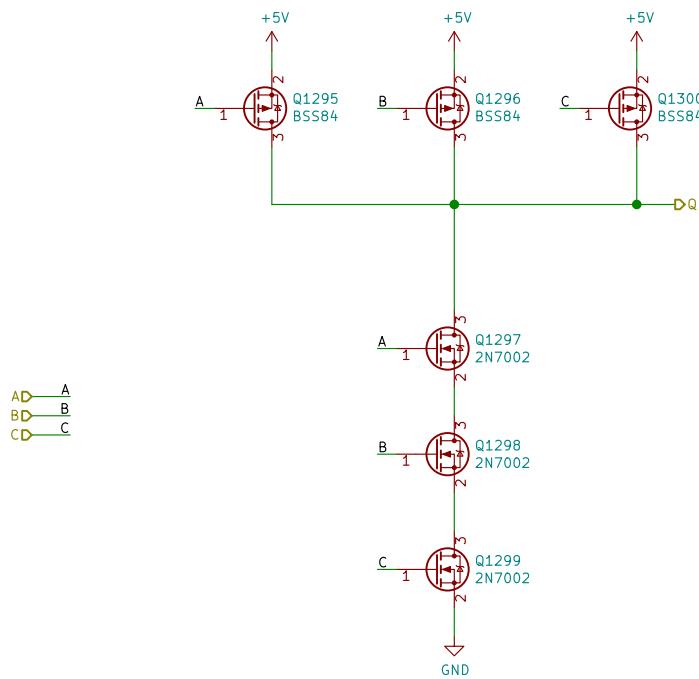
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5E86E86/sheet5EFA5AF5/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 341/362

A

B

C

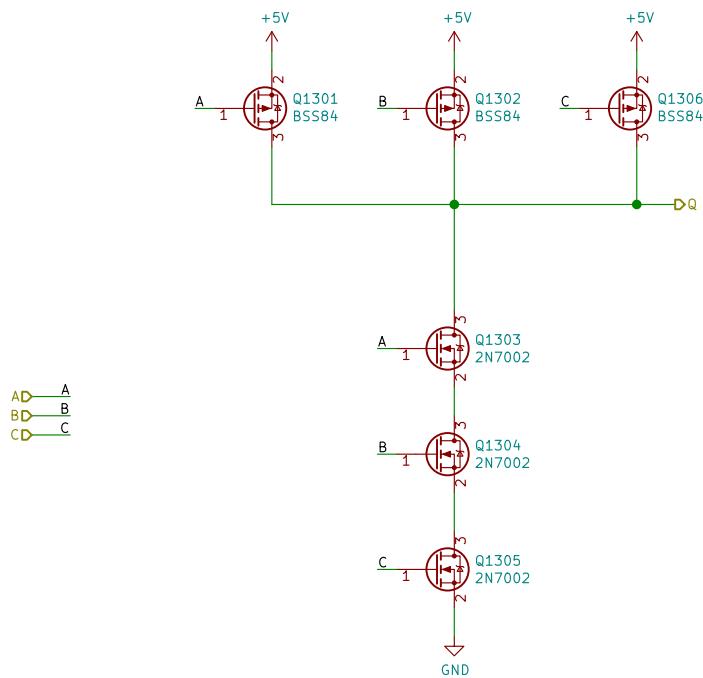
D

A

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5E86E86/sheet5EFA5CA7/

File: Gate\_NAND3in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

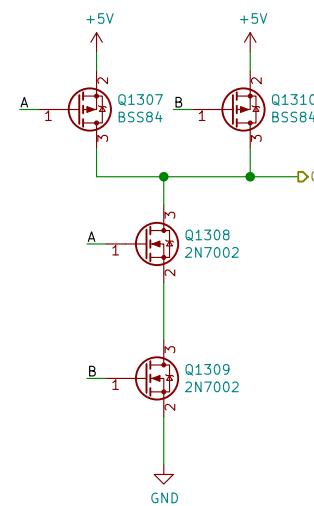
Id: 342/362

A

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D

AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5EFA6019/sheet5EFA6019/  
File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

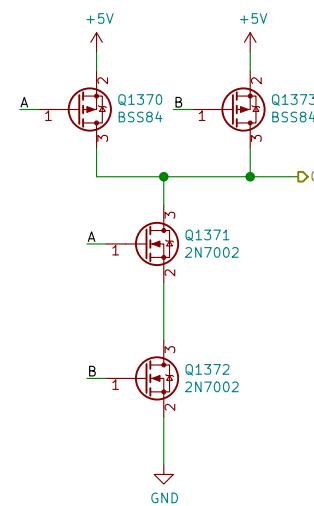
Id: 343/362

A

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AD—A  
BD—B

[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

[Philipp Schilk](#)

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5F46F157/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

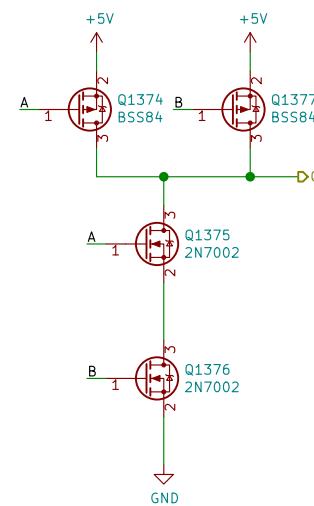
Id: 344/362

A

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D

AD—A  
BD—B[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /PlayerMem\_2/sheet5F1827A8/sheet5F46F774/

File: Gate\_NAND2in.sch

**Title: Fets and Crosses**

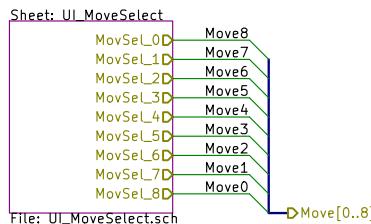
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

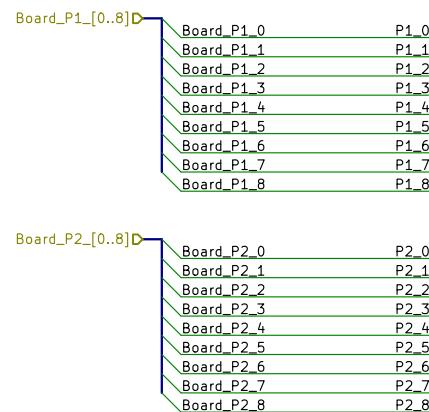
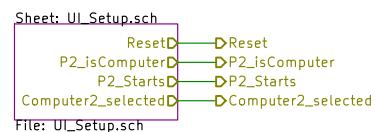
**Rev: v0.2**

Id: 345/362

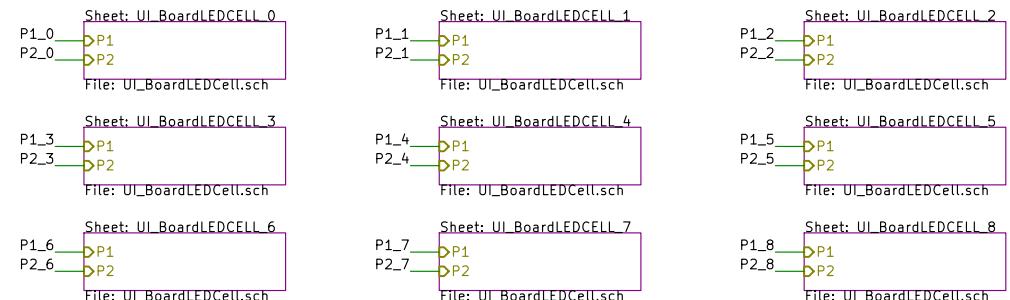
## Player Move Selection



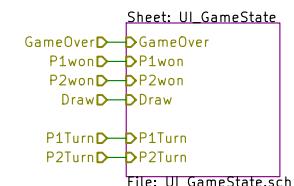
## Setup



## Board Display



## GameState Display



[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: `/UI.sch/`  
File: `UI.sch`

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A.	kicad (5.1.5)-3

Rev: v0.2	Id: 346/362
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A

A

B

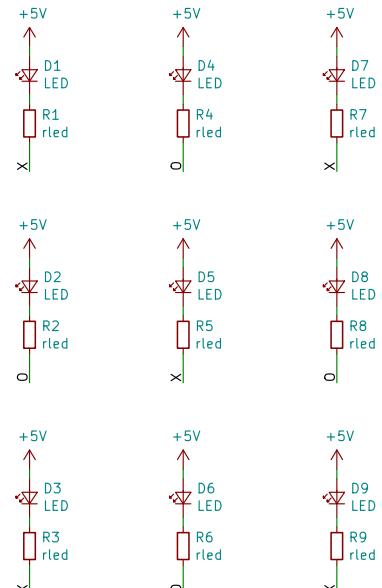
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_0/  
File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 347/362

A

A

B

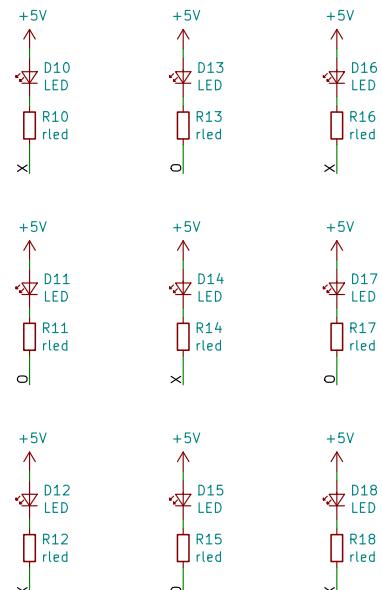
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_1/

File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 348/362

A

A

B

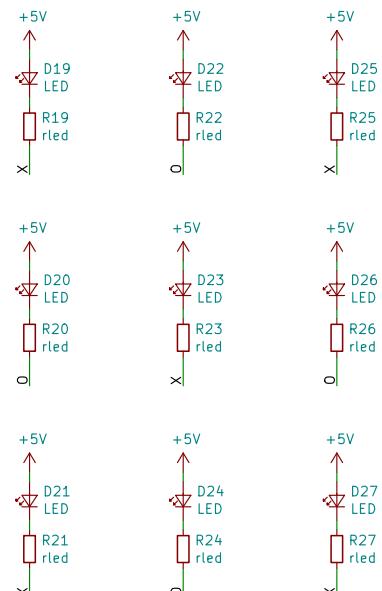
B

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_2/

File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 349/362

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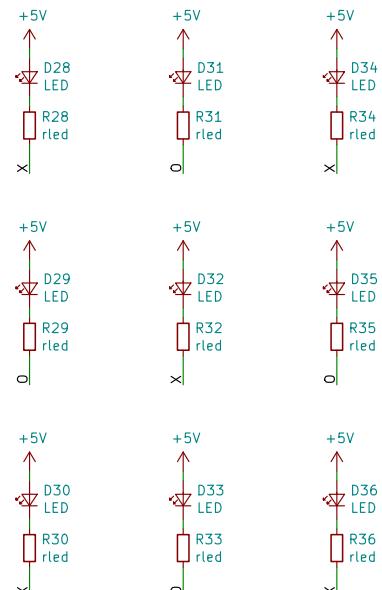
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_3/  
File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
Id: 350/362

A

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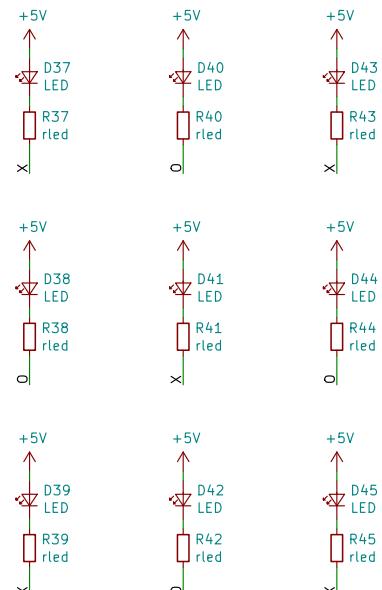
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_4/

File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 351/362

A

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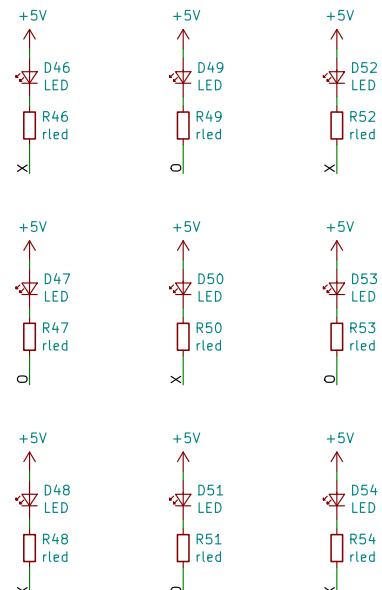
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_5/

File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 352/362

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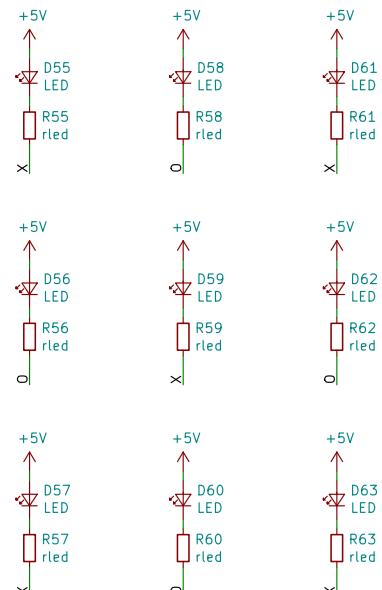
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_6/  
File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

Id: 353/362

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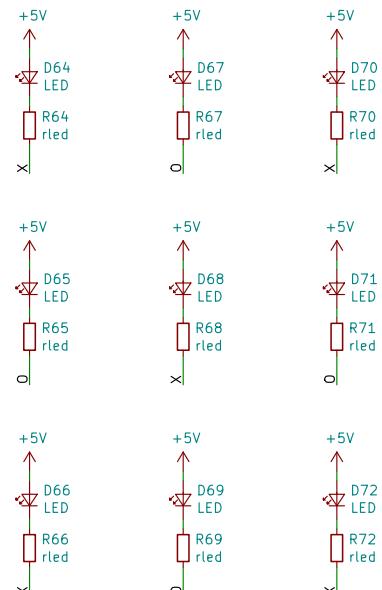
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_7/  
File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
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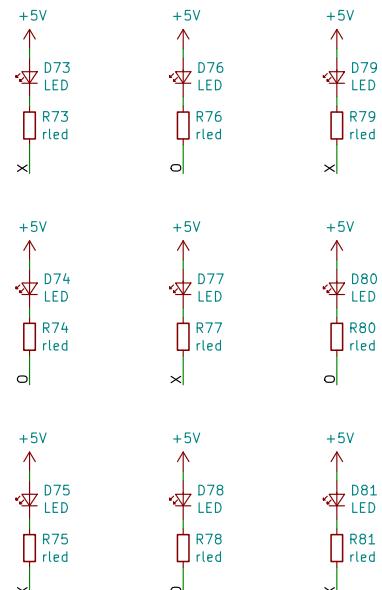
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_BoardLEDCELL\_8/  
File: UI\_BoardLEDCell.sch

**Title: Fets and Crosses**

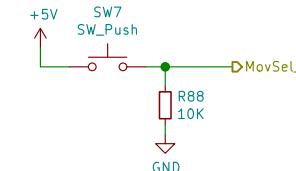
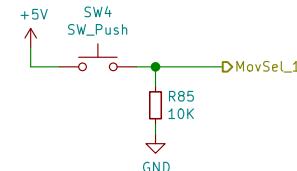
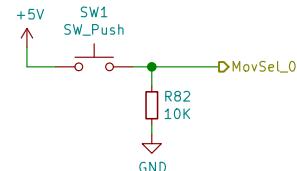
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

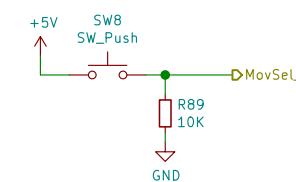
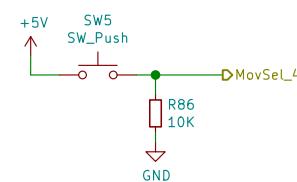
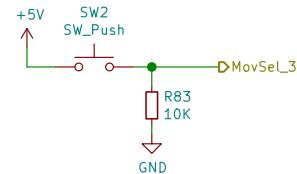
**Rev: v0.2**

Id: 355/362

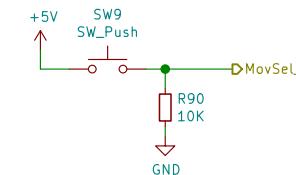
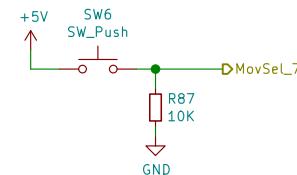
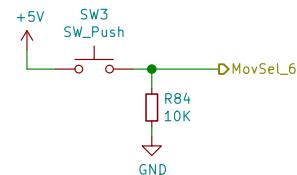
A



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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /UI.sch/UI\_MoveSelect/

File: UI\_MoveSelect.sch

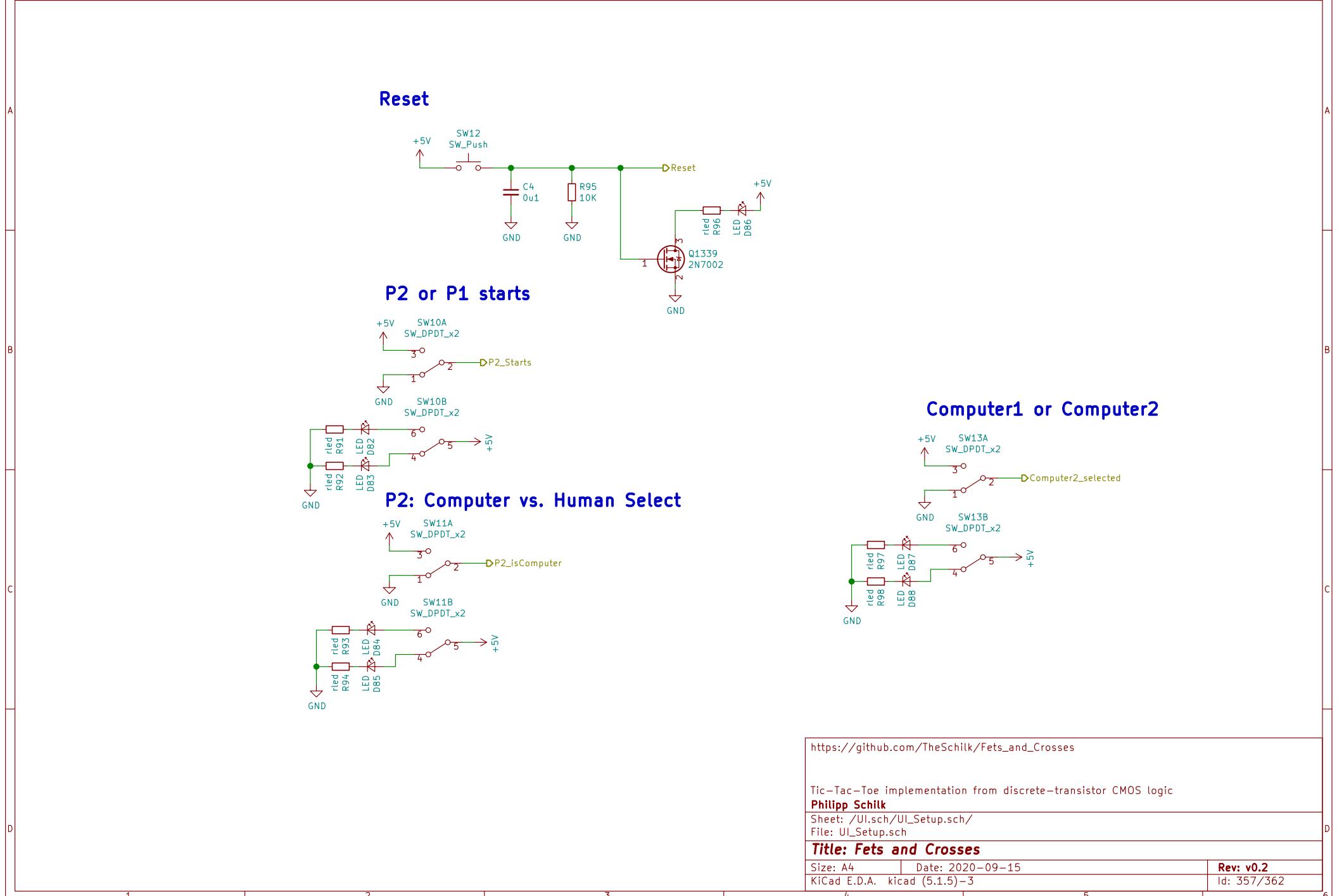
**Title: Fets and Crosses**

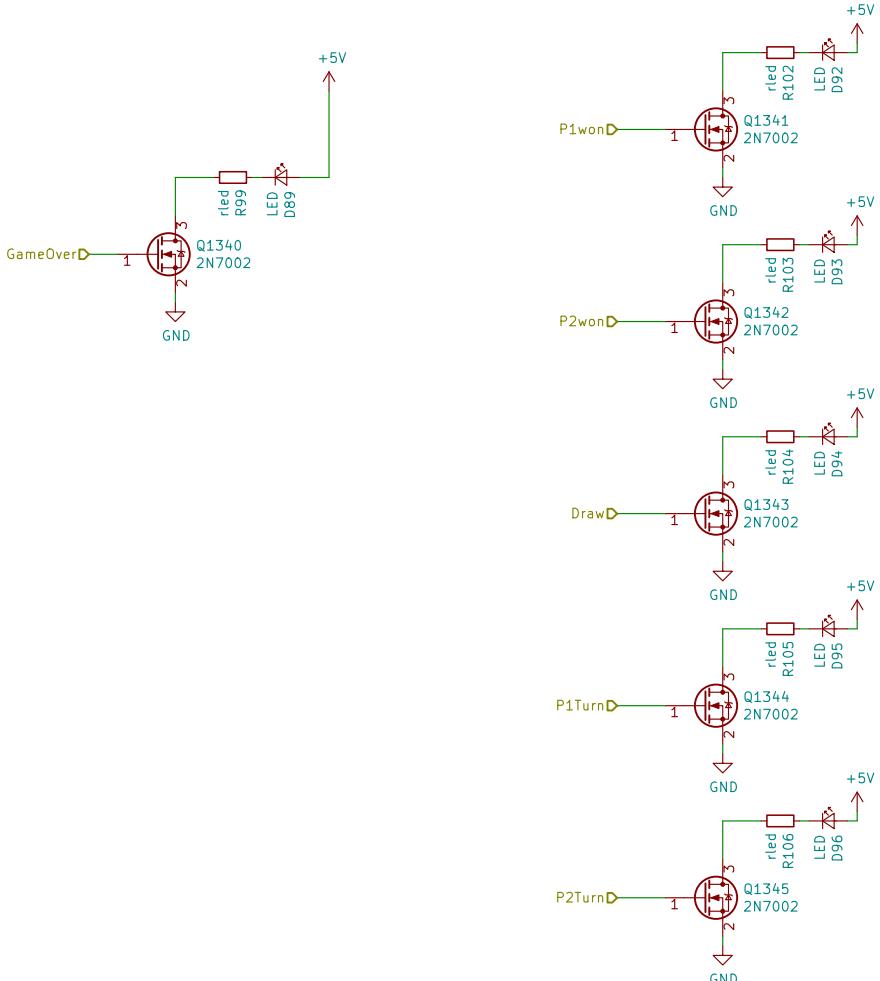
Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

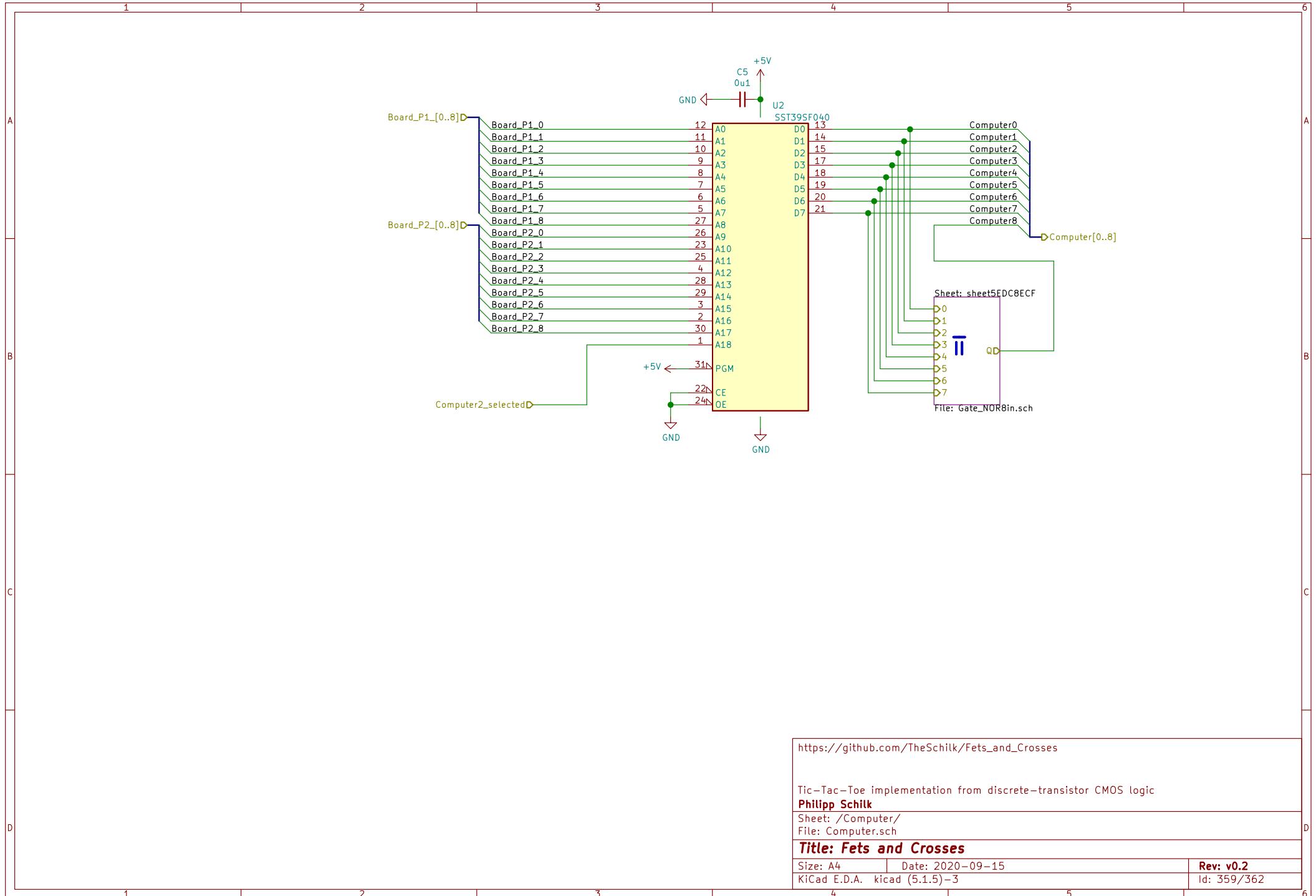
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**

Sheet: /UI.sch/UI\_GameState/  
File: UI\_GameState.sch

**Title: Fets and Crosses**

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	Rev: v0.2

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

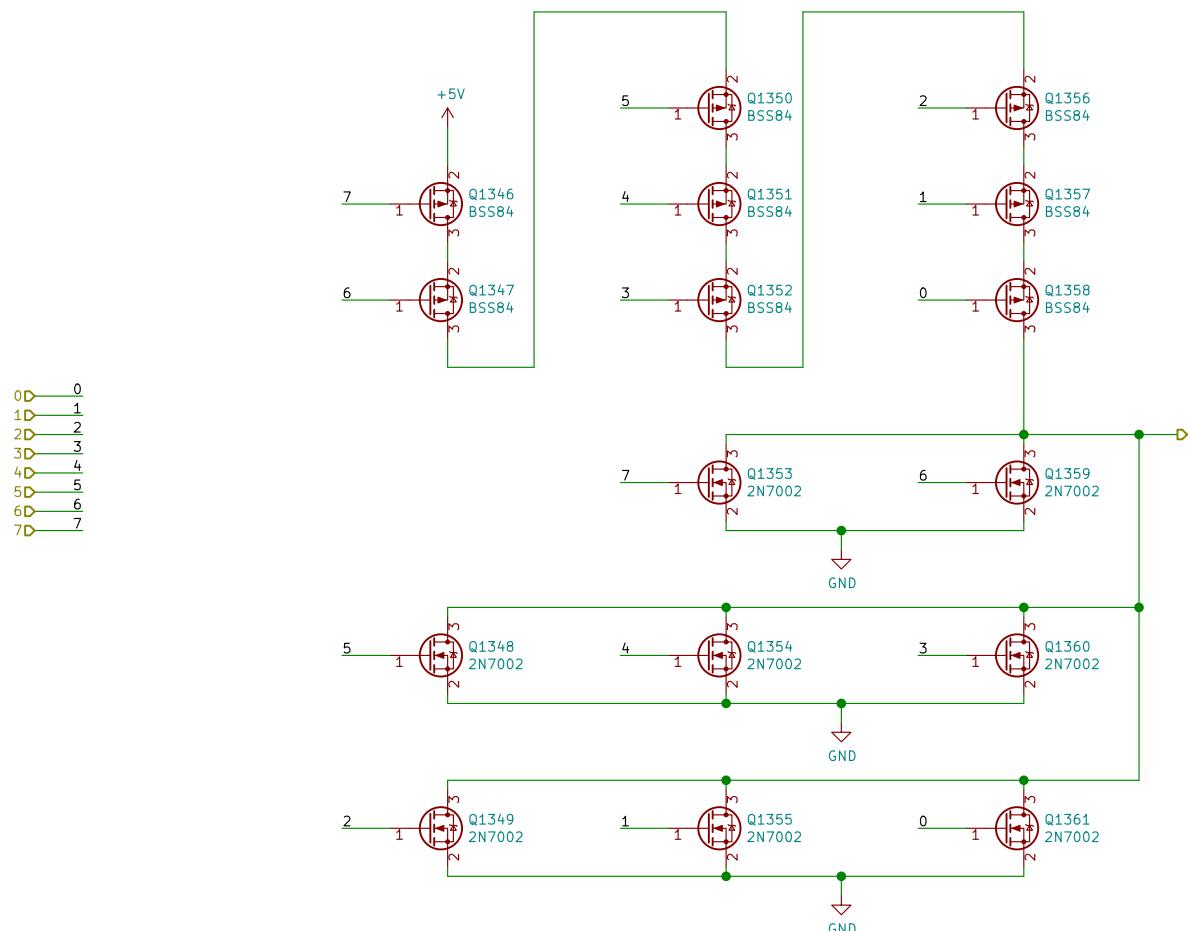
Tic-Tac-Toe implementation from discrete-transistor CMOS logic  
**Philipp Schilk**  
 Sheet: /Computer/  
 File: Computer.sch

### Title: Fets and Crosses

Size: A4	Date: 2020-09-15
KiCad E.D.A. kicad (5.1.5)-3	

Rev: v0.2
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philipp Schilk

Sheet: /Computer/sheet5EDC8ECF/

File: Gate\_NOR8in.sch

Title: Fets and Crosses

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

Rev: v0.2

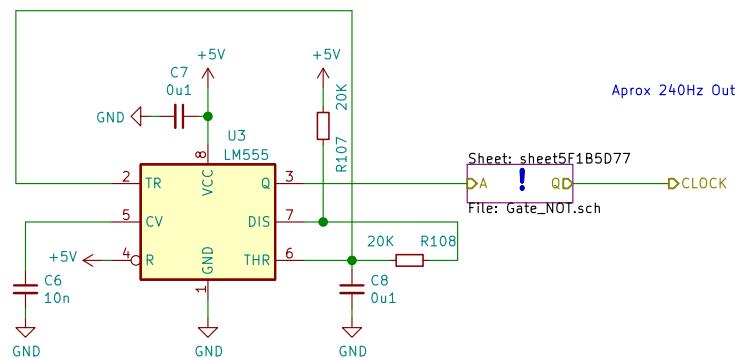
Id: 360/362

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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

Philip Schilk

Sheet: /Clock/  
File: Clock.sch

## Title: *Fats and Crosses*

Size: A4 Date: 2020

Rev. v0.2

Rev: V0.2

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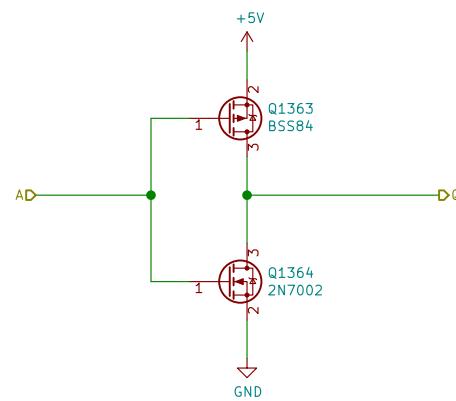
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[https://github.com/TheSchilk/Fets\\_and\\_Crosses](https://github.com/TheSchilk/Fets_and_Crosses)

Tic-Tac-Toe implementation from discrete-transistor CMOS logic

**Philipp Schilk**

Sheet: /Clock/sheet5F1B5D77/

File: Gate\_NOT.sch

**Title: Fets and Crosses**

Size: A4 Date: 2020-09-15

KiCad E.D.A. kicad (5.1.5)-3

**Rev: v0.2**

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