LVDS (Tx/Rx) Design
With 5V Devices in Sky130nm Process

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Revision 0.0

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LVDS Receiver Netlist

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** sch_path: /home/saumeek/xschem_test/Reciever_Netlist.sch

**.subckt Reciever_Netlist Vinp Vinn Vout VCC INN INP BGR Vss

*.ipin Vinp

*.ipin Vinn

*.opin Vout

*.iopin VCC

*.opin INN

*.opin INP

*.ipin BGR

*.iopin Vss

XM1 OP B Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=30 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM2 B B Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=30 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM3 ON B Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=30 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM9 OP A VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=10 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'
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+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM10 A A VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=10 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM11 ON A VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=10 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

I0_ref VCC net1 500u

I1_ref VCC net2 500u

R3 C B 0.5k m=1

R4 A C 0.5k m=1

R5 OP INP 0.5k m=1

R6 ON INN 0.5k m=1

XM7 C C Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=2.5 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM4 Vss OP net1 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=40 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1
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XM5 C net3 net1 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=40 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM6 C net3 net2 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=40 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM8 Vss ON net2 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=40 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

V1 net3 Vss 2.5

.save i(v1)

XM12 BGR BGR Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=5 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM13 net4 BGR Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=10
nf=1 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1
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XM14 F F Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM15 net7 F Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM16 N1 net8 Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67
nf=1 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM17 net8 net8 Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67
nf=1 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM18 net4 net4 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=40
nf=1 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM19 net6 net4 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=50
nf=2 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1
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XM20 net7 net7 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67
nf=1 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM21 N1 net7 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67
nf=1 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM22 H net5 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM23 net5 net5 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67
nf=2 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM24 E E VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM25 N1 E VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=67 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1
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XM26 net8 OP net6 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=50
nf=4 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM27 F ON net6 VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=50 nf=4
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM28 net5 ON D Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM29 E OP D Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM30 Vinv N1 VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=30
nf=1 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM31 Vinv N1 Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=35
nf=2 ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'
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+ sa=0 sb=0 sd=0 mult=1 m=1

XM32 Vout Vinv VCC VCC sky130_fd_pr__pfet_g5v0d10v5 L=0.5 W=50
nf=2 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM33 Vout Vinv Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=67
nf=1 ad='int((nf+1)/2) * W/nf * 0.29'

+ as='int((nf+2)/2) * W/nf * 0.29' pd='2*int((nf+1)/2) * (W/nf +
0.29)' ps='2*int((nf+2)/2) * (W/nf + 0.29)'

+ nrd='0.29 / W' nrs='0.29 / W' sa=0 sb=0 sd=0 mult=1 m=1

XM34 D BGR Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=83 nf=2
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM35 H H Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=83 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

XM36 N1 H Vss Vss sky130_fd_pr__nfet_g5v0d10v5 L=0.5 W=83 nf=1
ad='int((nf+1)/2) * W/nf * 0.29' as='int((nf+2)/2) * W/nf *
0.29'

+ pd='2*int((nf+1)/2) * (W/nf + 0.29)' ps='2*int((nf+2)/2) *
(W/nf + 0.29)' nrd='0.29 / W' nrs='0.29 / W'

+ sa=0 sb=0 sd=0 mult=1 m=1

**.ends

.end
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